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Mental Hygiene and the Health Department*

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IT has long been contended that activities for the promotion of mental hygiene should be incorporated into the program of operations of official departments of health. Propaganda to this end has been active and sustained. It is urged, and with truth, that the protection of mental health is as important as the protection of physical health; that mental disease is a large and growing problem of tremendous economic and social importance; and that health departments are the logical and, in fact, the only agencies capable of conducting certain phases of the program. In spite of this vigorous and long continued propaganda, health departments have been slow in undertaking definite programs of activity in mental hygiene. There have been, of course, exceptions, but in general the subject has not actively interested many of our health officers and health workers.

No small part of the difficulty in securing the incorporation of mental hygiene into the health program is due to the indefiniteness and confusion which surround the term "mental hygiene" itself. When we speak of the prevention of infant mortality, the promotion of maternity hygiene, or the prevention of tuberculosis, speaker and hearer alike have a reasonably clear and uniform conception of what is meant by the terms used. When we speak of mental hygiene, however, we may be considering either the need for improvement in the diagnosis and treatment of frank cases of mental disease, or an argument for broad sociological and economic changes which will reduce the pressure of anxiety or worry of the individual, and thus enable persons to maintain mental health who under existing circumstances break down. Between these extremes, perfectly definite clinical procedures on the one hand, and the broad and wishful thinking in economics and sociology on the other, are to be found a wide variety of ideas and procedures, all of which have the common aim of attempting to reduce the prevalence of mental disease in the

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community and to improve the chances of cure of those persons who may be attacked.

From the standpoint of the health department, therefore, to pick out from this congeries of ideas, hopes, and procedures, those things which are capable of incorporation into the program of a health department, has been by no means easy. Any preventive measure must, before it may be incorporated into the health program, conform to certain fairly well defined criteria. The procedure must first of all be really preventive rather than curative. Our health departments are not yet to the point where they can undertake the administration of purely clinical procedures not definitely preventive in nature. The procedure must be capable of general application, and be effective for the whole population. It must be capable of effective application at a reasonable cost. The total amounts of money available to our health departments are small at best, and the prospects of large additions to those funds are not great. Equally important, our procedures must be capable of application by personnel which is available in sufficient numbers to man the organization required. A public health procedure which can be carried on only by exceptionally gifted personnel, and of the highest qualifications, cannot hope for general application by health departments.

Many of the ideas included in the general term "mental hygiene" conform to those requirements. Mental hygiene is in large part still a matter of improved clinical service to the individual. Early recognition, skillful diagnosis, and effective treatment are by far the most important of the procedures now available. Preventive procedures other than those which depend upon wide economic and social change, are not commonly to be found in mental hygiene programs. Most of the procedures which have up to now been suggested are highly expensive and are capable of application only to small groups. Therefore, some of the difficulties which have been encountered in promoting the conduct of mental hygiene procedures are to be explained by these facts.

The prevention of mental disease rests on no such simple and well understood principles as those which underlie the prevention of communicable disease or the promotion of maternal and infant hygiene. It has as yet developed no simple and effective administrative technic. If the technics of preventive medicine are to be applied to mental disease, those phases of the problem capable of successful attack by these technics must be selected from the whole body of mental hygiene procedures and special personnel developed for their application.

The question of personnel is highly important. It is too much to expect that psychiatrists, however skilled they may be clinically, will develop these administrative procedures. The technics of public health are not unduly complicated or difficult. They are, however, special; peculiar to the field of preventive medicine. They must be mastered, if effective prevention is to be accomplished, whether the problem of disease be physical or mental. If our health departments are actively to enter the field of mental hygiene, a new type of personnel must be developed, familiar both with psychiatry and with public health methods, and these new workers must develop a new administrative technic.

Surveying the field of mental hygiene with a view to discovering problems capable of successful attack by preventive measures, it is evident that the conduct of purely clinical psychiatric procedures, whether for in-patients or out-patients, is not a task for which our health departments are designed or

organized, and there is no apparent reason why it should be given to them. Whether or not the field nursing activities auxiliary to such clinical services can be carried on by the nursing staff of our health departments, is exceedingly doubtful. All psychiatric experience seems to indicate that such nursing personnel must be highly trained and especially skilled, and that their activities are difficult and time consuming. To expect such new duties of our public health nurses, already heavily overburdened in both the amount and variety of work expected of them, seems out of the question.

It is in our school medical services that we recognize our first need for participation by health departments in mental hygiene activities. The addition of psychological and psychiatric activities to school medical services, where these are under the control of health departments, is highly necessary. The weeding out of the mentally retarded from the regular classes and the early diagnosis of the symptoms of beginning mental disturbances, in children and in teachers alike, is a truly preventive procedure of an importance far greater than the early detection of defects of the eye or ear. It is capable of incorporation into the school health program without difficulty.

It is perhaps in the schools and in infant welfare work that the largest immediate, potential field of usefulness of the health department is to be found. Our infant welfare service as at present organized maintains regular contact between physician and child for a large proportion of the child population in our cities, and in certain rural areas. The importance of the mental hygiene component of child welfare is, of course, undoubted. In our opinion, it is here that the preventive aspects of mental hygiene must be undertaken, if at all, by the department of health. The so-called child guidance clinics, or habit clinics, represent a difficult, expensive, and not highly successful effort to remedy defects in early mental training. Much of the work of our mental hygiene clinics and hospitals is likewise devoted to an attempt, often unsuccessful, to cure conditions which might have been prevented in the beginning. It would seem highly desirable, therefore, that an effort be made toward the prevention of these conditions before they arise.

This might conceivably be brought about by an increase in the activity of our existing staff of pediatricians and nurses in the habit training for very young children. If every clinic physician were impressed with the importance of the matter and made it a routine part of his work with mothers at the welfare clinic, and if our nurses were sufficiently interested in the subject to assist mothers in the home in the training of children, the desired result might be accomplished. This addition to the existing program of our welfare clinics will not be easy to secure, but if health administrators are genuinely interested, results will undoubtedly come in time.

The alternative procedure of adding a psychiatrist to the staff of the clinic for the purpose of assisting mothers in the training of children, encounters immediately the difficulties of expense and of the fact that personnel is not available at this time for such service. That this service can be made an integral part of the work of child welfare clinics, and that it is welcomed by the mothers to whom it is offered, has already been well demonstrated in an experiment which has been in operation somewhat more than a year in the Eastern Health District in Baltimore.

Another possible field of development is in public health nursing. There is no doubt that the field nurses of our health departments should have sufficient familiarity with elementary psy-

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chology to recognize at least marked deviations from the normal in persons encountered by them in their field service, and psychiatric consultation should be available for these cases. No one familiar with circumstances in the field will expect too much of this sort of activity. Public health nurses cannot be expected to know everything or to do everything, and we require too much of them at present. A little emphasis on the psychiatric aspects of their work, however, would probably be of great value to them in the solution of problems that they frequently encounter.

From the standpoint of the local health department, it would seem that a greater interest in the mental hygiene of the child, beginning with the earliest weeks through the service of the welfare clinic and the field nurse and continuing through school life, is a necessary and desirable thing and should be part of the development program of every department of health. The coördination between the mental hygiene clinic and the field public health nurse should likewise be developed.

In state service there should, of course, be close coöperation between the department of health and the department of mental hygiene. The local health department is the proper center for the itinerant mental hygiene clinic, and the field nurse must of necessity be the link between the clinic and the patient in the home. The principal activities of the state department of health will be in promoting this sort of coöperation in county departments of health.

Some question may be raised as to whether or not state mental hygiene clinics should be conducted by state departments of health or by mental hygiene commissions. In general, it would seem, from the standpoint of technical administrative control, that the mental hygiene commission is best adapted to the conduct of field activities in mental hygiene. The desirable relationship is probably not very different from that now prevailing between tuberculosis hospitals and local health departments.

Reviewing the field, therefore, it is evident that the health department's part in mental hygiene is still strictly limited. Within this limited field, however, there are great opportunities for useful service. Extension of the field will probably wait upon the development of personnel specially trained in preventive psychiatry.

The mental hygiene movement has suffered much from its friends and proponents. Their over-enthusiasm and their putting of propaganda so far in advance of procedure, have done much to obscure the very real importance of the subject. The coldness of practically minded health officers to it is not entirely unjustified.

The importance of the subject, the great popular interest which has been aroused in it, and the so urgent need for successful prevention, demand, however, that health officers attack the problem, develop the men and the methods needed, and prevent mental disease to the full extent to which prevention is possible.

Is There an Epidemiology of Mental Disease?*

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IT may be uninteresting to introduce the discussion of a subject by considering definitions, but it seems rather necessary to do so in the present instance as the science of epidemiology is not generally considered by those most concerned with it to include mental disease. I have looked over many texts and in none do I find any systematic discussion or treatment of mental disease as an epidemiological topic. In one book, *Epidemics and Crowd Diseases* by Greenwood (1935), there is a passing reference to dancing mania and similar emotional disturbances of crowds which are considered worthy of epidemiological study. The Vaughans in their textbook *Epidemiology and Public Health* (1923) define epidemiology as the science of epidemics, and state that for a disease to be considered of epidemiological concern a necessary criterion is that it be infectious, or at least possibly infectious, and further that the cause of infection be some germ or virus. A reading of Sir William Hamer's *Epidemiology: Old and New* would also lead one to the same way of looking at epidemiology. A break with the need of requiring infection by germ or virus is made by Greenwood in the text mentioned above. We quote him as follows:

> Epidemiology came to mean the study of diseases, any disease, as a mass phenomenon. It differs from the study of disease by a clinician primarily in respect of the unit of investigation. A physician is concerned with, say, typhoid fever from the point of view of the individual patient, to determine from his experience and the results of his examination (a) that the patient is suffering from typhoid fever, (b) how the case is likely to develop—its prognosis, (c) what treatment is likely to give the patient the best chance of recovery. An epidemiologist is concerned with a prevalence of typhoid fever; he wishes to determine the probable course of that prevalence, whether there are likely to be more cases, when the maximum will be reached, what should be done to reduce the prevalence. The physician's unit of study is a single human being, the epidemiologist's unit is not a single human being but an aggregate of human beings, and since it is impossible to hold in the mind distinctly a mass of separate particulars he forms a general picture, an average of what is happening, and works upon that (page 15).

Because of Greenwood's non-insistence upon an infectious *materies morbi*, he is able to include a whole chapter on cancer. Although it is perhaps the least valuable chapter in the book (because at the time it was written very little of definite epidemiological value about cancer had been deduced), nevertheless it is worthy of note because

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it means that epidemiology need not be limited to those diseases caused by some form of infectious agent. Greenwood's book, however, has no chapter on mental disease. So far as I have been able to find in the literature, there is no systematic work dealing with this important class of diseases.

My first conception of an epidemiology of mental disease came from Dr. Milton J. Rosenau, formerly Professor of Preventive Medicine and Hygiene at the Harvard Medical School and School of Public Health. When I was a student of his in 1923–1924, I heard him state that there was an epidemiology of mental disease, even though this was not generally recognized. As a matter of fact, in his department at least one worker was giving his full attention to the epidemiological study of mental disease.

The social and economic importance of mental disease warrants its being included in a science of epidemiology. This no one can doubt. Statistics show that more than one-half of all beds devoted to the care and treatment of disease throughout the country are filled by patients suffering from some form of mental disease. This fact alone entitles it to be a prime concern of public health. When we realize that a good part of the population residing outside of hospital walls suffers from some form of mental disease or disorder, this primacy cannot be challenged.

One might ask how has it come about that a factor of such importance to the public health failed to be included in the science of epidemiology. One of the reasons is perhaps that from early days public health departments have dealt with communicable diseases while other branches of government have had the care and treatment of mentally diseased persons. Undoubtedly another reason is the taboo that has surrounded mental diseases, a taboo which has in part resulted from the Christian attitude toward the body-mind problem, the body being the concern of the physician and the mind of the church. Possibly another reason is the fact that it is only recently that psychiatry has been seriously interested in the matter of the control and prevention of mental disease, chiefly through the influence of the modern mental hygiene movement. A further reason may be the confusion which one may note in current psychiatry as to the nature and origin of mental disease.

For the past 20 or 30 years psychiatrists have been divided into various schools differing mainly in their way of looking upon etiology. These may be roughly classified as (1) the organic, (2) the psychological, and (3) the eclectic, this last having characteristics of the first two.

The organic school stresses etiology, with a noxious agent or organic change as being the prime cause of mental disease. The psychological school and to a considerable extent the eclectic school look upon mental disease rather as the various abnormal ways in which human beings react to difficult situations in life. These difficulties may be inheritance in terms of defective germ plasm, or noxious agents such as infectious metabolic and external poisons, or they may be psychic trauma, mental conflicts, trying situations, and the like. Each individual is looked upon as unique, with a personality which is the resultant of a constitution developing in a continuing series of experience from birth to death. Man is a gregarious individual, and one of the risks of life is the hosts of possible trauma coming about from his contact with his fellow men. He is not only a physical being but a feeling and thinking individual. In terms of present-day philosophy he is not to be looked upon as a mere machine reacting mechanically to internal and external stimuli but as an organism capable of creating

new reactions in response to the various stimuli of existence.

Perhaps an example cited here will help to clarify my discussion at this point. Two individuals may have an influenza infection. One has chiefly pulmonary symptoms, together with the usual mental depression and the general aches and pains which go with the disease. The second has as his main symptom-complex the so-called schizophrenic reaction—a special type of abnormal mental picture. I do not need here to enter into a description of this type of reaction, except to state that it represents in terms of the psychiatrist a splitting of the psyche, a bizarre reaction of the individual, resulting from the disintergrating effects of the toxins of the influenza infection upon the brain. For the group of psychiatrists belonging to the organic school, it is enough to note that we have a psychosis, a mental disease with a certain mental picture, the direct result of an influenza infection. For the other two groups of psychiatrists, it is more important to note the particular way in which the individual reacts to this toxic agent, to note the kind of mental picture and behavior that results, the kind of personality he had before the onset of the infection, and, what is most important, how the patient came to behave that way and to develop a psychosis. In other words, the more modern schools of psychiatry are interested in the dynamics of those influences which caused a certain personality to develop a particular psychosis, and the infective agent is only one of the many influences or factors.

Undoubtedly this discussion of the differences in etiological systems may be confusing to the non-psychiatrist. Essentially this situation is not unique to modern psychiatry, as we find something similar in epidemiological discussions of the last decade or two. Particularly Greenwood and Hamer of England make much of the point that epidemiology until recently suffered considerably from being too exclusively concerned with the significance of the single etiological agent—the bacterium or virus—and neglected what is perhaps the more important contribution of epidemiology—a concern with all of the significant and pertinent etiological factors which cause a disease to appear in a community, including hereditary influences.

The way in which medical men look upon etiology may be simply a matter of temperament; some prefer to be single etiologically-minded while others prefer to be plural etiologically-minded. This latter tendency is fundamental to much of modern psychiatry, even though we are compelled to note a paradox in the acceptance of a new classification of mental disease adopted by the American Psychiatric Association as recently as 1934 which explicitly emphasizes the single noxious agent, or organic pathology, as the main discriminating criterion of disease entities. This more recent classification exhibits this new emphasis more definitely than the first classification approved in 1916.

There is perhaps another reason why mental disease has only recently come to be recognized as a topic of epidemiological study, and that is the fact that practically the only statistics available in the field of mental disease are of hospital population, in contradistinction to statistics from community populations of communicable diseases and the other physical diseases. Statistics of hospital populations are quite apt to suffer from administrative and legal practices which tend to vary from locality to locality as well as in time. This dependence upon hospital statistics leads one to lean too heavily and too exclusively upon the use of proportionate morbidity as the usual type of

statistical analysis, and this our statistical friends state is a dangerous practice when one uses these statistics for the purpose of inference.

When a man dies, there is no question about it, but there may be some question about the disease to which he succumbed. In many instances there is even more question as to what particular ailment a person is suffering from. The death certificate takes pretty good care of the first two categories, while the latter is quite dependent upon the vagaries of the reporting physician. It may be true, however, that because of the nature of the more serious mental diseases, we get a better picture of the incidence of mental disease from hospital statistics because of the necessity of the incarceration of these patients in a hospital for mental diseases. This picture may be found, however, only in those state administrations where the facilities for care and treatment are adequate and where popular opinion and medical coöperation favor the admission of patients to mental hospitals. This means, therefore, that there are only a few states whose statistics are fairly reliable from this point of view. There may also have been suspicion in the minds of some epidemiologists that some of the statistics available in the annual reports of state hospital administrations and particular institutions may not have been properly presented or prepared. The recent work of Dayton in Massachusetts, some of it unpublished, demonstrates this.

I might venture one final reason for the late interest by epidemiologists in mental disease as being that much of the factual material involves more or less intangible concepts, because psychiatry, dealing so much with the mind, must perforce concern itself with subjective experience, which is so difficult for scientific study and analysis. For example, sex in a statistical sense offers no difficulty at all to the statistician, but the complicated concepts of the development of the libido are perhaps too much and too difficult for him. Another example may be given as follows: The epidemiologist in the field of communicable disease has generally little trouble with the determination of the onset of an attack of disease, but when one comes to the determination of the onset of a case of schizophrenia, it is one thing if one is a Kraeplinean, another if one is a Meyerian, and still another if one adheres to the psychoanalytic school. This difficulty with etiology, however, is not limited to psychiatry. It is to be noted more particularly in the field of chronic physical diseases, such as chronic nephritis, arthritis, cardiac disease, etc.

Up to this point the discussion has been more or less aimed at demonstrating that mental disease is a proper concern of epidemiology and giving reasons to explain why it has only very recently come to be considered worthy of attention by epidemiologists.

The balance of my discussion will cite a few important facts in the history of the epidemiology of mental disease, even though it be a recent and short one. This is done to further the thesis that there is an epidemiology of mental disease by demonstrating that actual work has been and is being done in this field. (A second paper, which may be available later, would do this more definitely.) Before going further I wish to make it plain that I differentiate between administrative statistics and such statistics as have been utilized for a definite epidemiological purpose. The reason for mentioning this is that so much of state hospital statistics are gathered and prepared just with administrative objectives in mind.

It is difficult to state exactly when statistical information was prepared

and made available and studied from an epidemiological point of view. It is my opinion that the best way to answer this question would be to say that the epidemiology of mental disease started in 1916 with the acceptance of the first classification of mental disease adopted by the American Psychiatric Association and the National Committee for Mental Hygiene. The person to be given credit for this pioneer development in the epidemiology of mental disease is Horatio M. Pollock, Statistician of the New York State Hospital Commission. He also became the first Director of the Bureau (later called Department) of Statistics of the National Committee for Mental Hygiene. Dr. Pollock's influence extended still further in connection with the Federal Census as he was largely responsible for the development of that section that deals with mental disease.

From 1916 to about 1928, the State of New York held the foremost position in this field. Of course, here and there isolated writers discussed some forms of mental disease in an epidemiological way, but what is meant here is any systematic, continued attack on the problem. About 1928, Massachusetts, under the leadership and stimulus of the late Dr. George M. Kline, then State Commissioner of Mental Diseases, offered the most elaborate and serious attack on the problem to be noted in this country.

With funds made available by the state and by the Rockefeller Foundation, a very large and competent research statistical department was organized under the direction of Dr. Neil A. Dayton, whose many contributions to the epidemiology of mental disease and defect are well known.

Almost coincident with the development of this work in Massachusetts came somewhat similar attempts, particularly in the State of New York under the joint auspices of the Statistical Division of the State Department of Mental Hygiene and the New York State Committee on Mental Hygiene of the State Charities Aid Association. This work was directed by Raymond G. Fuller, assisted by Horatio M. Pollock and Benjamin Malzberg. A more intensive investigation in the social factors of schizophrenia was attempted for a period of 7 or 8 years under the auspices of the Boston Psychopathic Hospital and the Massachusetts Society for Mental Hygiene.

The U. S. Public Health Service has also been interested in this field and in conjunction with the National Committee for Mental Hygiene has recently made an organized advance. The stimulus for this most recent development comes from Dr. Walter L. Treadway, Director of the Division of Mental Hygiene of the U. S. Public Health Service.

Possibly the best statistics on mental diseases in this country are now provided by the Massachusetts State Department of Mental Diseases. This department was the first to recognize the urgent necessity of preparing adequate statistics on the resident population. Before that time statistics on mental diseases had been confined to admissions, discharges, and deaths. While this analysis gave an interesting picture of the movement of the population, it overlooked the serious problem of the accumulation of mental patients within our mental hospitals. The Department of Mental Diseases in the *Annual Reports* since 1928 inaugurated another important change. It divided all discharges, deaths, and resident population into first admissions and readmissions. Formerly it had been the uniform custom to divide admissions into first admissions and readmissions, but to group the discharges, the deaths, and the resident population. Thus, if anyone wished to

follow through what had happened to first admissions, for example, he would be blocked by the fact that statistics on this classification were not available in the discharges, deaths, or resident population. Massachusetts, in making this important division, enabled anyone to follow through and determine discharge rates, by age, for example, of all first admissions. These figures, based upon the present age distribution in the resident population plus the discharges and deaths, give ample opportunity for discriminating analyses of first admissions. Owing to their method of division, similar studies can be made on readmissions.

We see then that mental disease is a proper concern of epidemiology from the point of view of contemporary definitions of this science. The past 20 years or so have witnessed an increasing amount of epidemiological knowledge in this class of diseases and it is my opinion that during the next decade or two mental disease will become an important part of epidemiological science.

Achievements in Mental Hygiene and Promising Leads for Further Endeavor*

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IN less than 30 years, the term "Mental Hygiene" has been incorporated in our medical vocabulary and has become associated with a wide range of activities, problems, and possibilities that challenge attention. During this comparatively short time a promising beginning has been made in improving diagnostic and therapeutic arrangements for the mentally afflicted, in strengthening training programs for professional workers, in organizing research, in defining spheres of responsibilities for mental health conservation, in gaining a better understanding of the dimensions and significance of mental hygiene tasks, and in the discovery of profitable lines for further endeavor. It is true that many thoughtful men today are prone to refer to mental hygiene as the most backward branch of medical science, but such an appraisal should not blind us to the fact that there is substantial evidence to indicate genuine progress in this field, and that there are splendid opportunities for productive work that will enrich public health, education, and social service.

It may be worth our while to review briefly some of the activities that have been contributing to mental health conservation and to give consideration to beginning trends that may lead to significant achievements.

The initial efforts in mental hygiene were directed to the improvement of mental hospitals. Through surveys, public education, and the stimulation of larger expenditures for psychiatric services, an impetus was given to the ushering in of a new deal, as it were, to mental hospital psychiatry. Transformations that were effected in connection with many of our public institutions are illustrated by changes that were brought about in a Canadian mental hospital that I have visited annually since 1918.

Twenty years ago this hospital had 800 patients with only 1 physician in charge. There were no trained nurses. Physical restraint and seclusion were common practices. No attempt was made to furnish occupation for the patients. Deadening idleness abetted deterioration. The rehabilitation rate was low. Today this Canadian hospital is staffed by competent psychiatrists and trained nurses. The reception service for early and recoverable cases is housed in a well designed building and has a complement of 1 physician to 90 patients and 1 nurse to 3 patients.

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There are well organized divisions for various therapies—occupation, physical, recreational, hydro, and so on. Out-patient clinics and public educational activities have been organized. Research programs have been fostered, and as a result of such progressive steps there has been a gratifying stepping up of the rehabilitation rate.

Such an improvement of therapeutic services in many centers has been appreciated by the general public and has led to the referral of an increasing number of patients for hospitalization. In this connection it is interesting to note that in 1910 there were 159,096 patients in the state mental hospitals of this country. In 1936, the number rose to 398,006, an increase of 150 per cent although the population of the United States, as a whole, increased by only 40 per cent during this time.

Unquestionably mental hospital services have been improved and extended, but if we consider the United States and Canada as a whole, we discover that the advance has not been along an even front—that there is considerable variation in the degree of excellence of institutions in certain areas as compared with others. This is revealed through a recent study conducted by the National Committee for Mental Hygiene that involved a canvass of the 169 state mental hospitals of the country in reference to 18 standards that reflected their clinical and scientific status. The New England and Atlantic states stood at the top of the list, according to the scheme of rating adopted, and the Southern states at the other extreme furnished a considerable contrast. Of the 169 hospitals, only 47 were adequately organized, staffed, and equipped for the most effective clinical and scientific work; and it was discovered that overcrowding was seriously hampering therapeutic activities in many places. Apparently, 78,000 additional beds are required in the United States, and Canada is also faced with the need for a marked extension of facilities.

It is evident that the mental hospital situation furnishes a continuing challenge in the mental hygiene field. It is of prime importance that our hospital services be elevated to a high plane of efficiency not only because of their strategic importance in the treatment of the mentally ill but also because of the part they can play in fostering community health programs, research, and prevention.

In a review of mental hygiene progress, reference should be made to the organization of out-patient clinical services throughout the country. The first child guidance clinic was established in 1909. Today there are 153 clinics for children each having a psychiatrist, psychologist, and psychiatric social worker on its staff. The total number of clinics for both children and adults stands at 683 for the United States and 53 for Canada. They are meting out a diagnostic and therapeutic service for more than 12,000 new cases annually.

The actual contribution of clinics to rehabilitation and to prevention is difficult to determine, but there is some available evidence to indicate that they are performing a useful function in this regard.

A striking illustration is furnished by experience in the Oxford District in England where the population is stable—the birth rate equalling the death rate, with immigration and emigration cancelling each other. This district is served by one mental hospital and, since the organization of an affiliated clinic during the war, the admission rate to the hospital has gradually declined although the admission rate to the mental hospitals of England and Wales as a whole has been increasing.

The value of clinics cannot be estimated by reference to mental hospital

statistics alone. They have been an important factor in revealing the mental health needs of communities and in stimulating the development of well rounded programs; and those specializing in child guidance have, in many instances, been training centers for physicians, nurses, parents, teachers, and social workers. They have injected a new and needed note in child rearing by emphasizing the importance of taking into account factors of significance to insure healthy mental growth.

No single phase of mental hygiene progress has been of greater moment than advances, during recent years, in strengthening arrangements for the psychiatric training of physicians. Since 1930, more than half of the 68 accredited medical schools of the United States and Canada have subjected their courses to thorough reviewing and have developed better facilities and procedures for pre-clinical and clinical instruction. In these forward looking schools, emphasis is being placed upon the necessity of taking psychological and situational factors into account in all medical practice. Advances have also been effected in connection with postgraduate training in psychiatry. With the development of a number of well organized and ably staffed centers, the United States is gradually assuming a position of leadership once held by European countries. An impetus was furnished for progress in this direction when 2 years ago there was created the American Board of Psychiatry and Neurology that is demanding high qualifications before certification.

There is no question that the attitude of the medical profession generally toward psychiatry is becoming more hospitable. This is particularly true in reference to pediatricians. Many leaders in this field are today prepared to define pediatrics as concerned with child development—mental as well as physical—and they believe that the pediatrician of the future must be equipped to deal with both the physical and mental hygiene problems of children. If progress is made in this direction preventive work will be markedly strengthened.

Other disciplines in addition to medicine are incorporating mental hygiene in training arrangements. This trend is to be found in the fields of nursing, social work, and theology, and is a promising development because the safeguarding of mental health requires the participation of the various allies of medicine.

The question may be asked if the challenges for research in mental hygiene are being met in a statesmanlike way commensurate with their importance. In answer it should be stated that until recently investigatory work has been unduly neglected and that the comparative backwardness of psychological medicine has been due, in large measure, to the paucity of our knowledge concerning the intrinsic nature of mental disorders and their causation; but there are evidences today that research will receive more attention in the future than has been the case in the past. Encouragement is being provided by great foundations, the Scottish Rite Masons, philanthropic citizens, and a few governments who are making funds available for investigatory purposes. There seems to be no dearth of scientists with well defined programs for research who are eager to prosecute studies in this field. In the state mental hospital services alone, there are 100 well qualified men who desire a greater flexibility of working program to enable them to devote more attention to studies in hand. A recent survey of research activities in dementia praecox revealed that $650,000 per annum could be put to good account in assisting well conceived projects in this field.

That the fruits of research will be seized upon for practical application in treatment and prevention is indicated

by experience in the testing out of the insulin shock treatment for dementia praecox during the last 12 months. In this time 800 patients have been subjected to this form of treatment in New York State alone, with one hospital reporting a return to the community, in improved state of mental health, of 65 per cent of 81 treated cases.

Whether or not insulin shock proves to have abiding value the point should be stressed that psychiatry today is sensitive to scientific advance and recognizes the need for more and more investigatory effort.

In looking to the future there are many beginning trends that are promising and, if firmly established during the next few years, may lead to genuine progress in health conservation. Four avenues for advance commend themselves particularly to the Canadian National Committee for Mental Hygiene and there will be concerted effort in the Dominion, during the next 10 years, to reach specific objectives in each area of work. Since the objectives have pertinence for the United States as well, I will state them and discuss one in particular that relates to public health.

The first objective entails the placement of treatment arrangements for early and recoverable cases of mental disorders, on as thorough-going a basis as pertains today in general hospital practice for those afflicted with physical disabilities. This will involve the development of intensive treatment units in every Canadian mental hospital, to be staffed with a complement of physicians, nurses, occupational workers, and other personnel, and with appropriate building and plant arrangements to facilitate the creation of a wholesome, cheerful atmosphere for constructive therapy and individualized attention. While costs will necessarily be increased, savings will be effected through the rehabilitation of a larger proportion of patients than has been the case in the past.

The second objective relates to research. There will be the aim of securing governmental action for the appropriation of 2 per cent of mental hospital budgets for investigatory purposes. Such action will contribute to the placement of psychiatric and mental hygiene research on a sound basis and will furnish an impetus to the nourishing of a scientific spirit among hospital staffs that should be reflected in the improvement of clinical work.

The third objective involves the development of a partnership between health workers and educators for the fostering of mental health conservation among school children. It is assumed that, if the circumstances and conditions for child development during the school years are conducive to healthy growth, a reduction can be effected in the incidence of mental disorders—a reduction of the 4 per cent of school children who today seem destined at some time in their lives to enter mental hospitals as patients, and a reduction of the still larger percentage who can be expected to swell the ranks of the psychoneurotics and misfits.

The fourth objective involves the integration of mental health endeavor into the public health activities of the Dominion, with responsibility for the administration of clinics, the community supervision of maladjusted individuals, the conduct of mental hygiene educational programs for certain professional groups and the general public, and the correlation of all mental health work. At present community mental hygiene programs are loosely organized, with inadequate arrangements for the rehabilitation of paroled patients from mental institutions and of others requiring supervision. There is thus a magnificent opportunity for public health endeavor to right this situation and to place community mental hygiene work

on a basis that will compare favorably with the best programs in the field of tuberculosis.

In many ways this fourth objective of assigning to public health departments the responsibility of developing community mental hygiene programs is the most important of all. We appreciate that success in bringing mental disabilities under control will be dependent in large measure upon the degree of effectiveness of community arrangements for prevention and early treatment, and in facing up to such issues the efforts of a few psychiatrists serving large populations is not enough. There is need for concerted action on the part of health, educational, and social work forces. There is the need for the development of long range comprehensive programs wherein the needs and potential resources of the community are taken into account. Epidemiological studies are a necessary first step in the introduction of constructive efforts wherein the sanitation of the environment from the mental health point of view will be an objective.

Such a broad gauge program necessitates medical leadership under public health auspices, and it is hoped that during the next 10 years leaders in public health will accept the challenge and will pave the way for the active assumption of responsibility. As one prerequisite in this regard there is entailed the mental hygiene training of public health workers. Without such training there can be no constructive participation by public health forces in mental hygiene work. Our efforts today should be focused therefore on this issue.

In conclusion, may I say that the future for mental hygiene is bright if leaders in public health, education, social welfare, and the supporting sciences will view mental hygiene problems, not as the sole concern of a limited group of specialists, but as a vital challenge in their own field.

Patients, Not Diseases, Are Treated

SIR Auckland Geddes, in an address delivered at the Bicentenary of the Royal Medical Society (reported in the *Edinburgh Medical Journal*, 44:366, 1937, and quoted in *Economics of Radiology*), said:

> Time and again, when, in various parts of the world, I have found myself ill or injured and confined to bed, I have been attended by doctors who never even found out that I had any medical training; in fact, they never found out anything about me at all. They were concerned to treat "The Injury" or "The Disease" and not me, the patient; they were, in short, dealing with a pure abstraction and thinking that they were being very scientific. The more I have seen of life and death, of pain and suffering, the more clearly I have realized that there is never in the real world outside the walls of the Medical School and teaching hospital "A Disease" to be treated; there is never "An Injury" to be dealt with; there is just a sick child, woman, man, to be helped to get well. In short, the real business of clinical medicine is not science. It is, in the case of each sufferer, a personal relationship into which sincerity and medical knowledge are suffused by the physician, and trust and some dependence by the patient.

Relationship of Maternal and Child Health to the General Health Program*

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THERE is an interdependence between measures directed toward improving maternity and child health and those directed toward improving the general health. There is a similar interdependence between all public health measures and measures designed to promote social welfare and security.

While this Conference is concerned primarily with the health of mothers and children, let us bear in mind that all health problems are family problems, and that family health is one phase of family security. In the mass, family security means social security. Better maternity and child health is or should be among the underlying purposes of any social security measures.

Our specific measures to protect the health of mothers and children count for little if the family income is insufficient to supply nourishing food and decent housing, if the mother's health is undermined by unhealthful sweatshop conditions, or by long hours. Efforts to improve child health count for little if the child must labor in a factory with no opportunity for normal recreation and development. Similarly community protection against impure milk and water, against the acute communicable diseases, against tuberculosis and syphilis and other preventable diseases which shatter the family well-being, has a direct bearing upon child health on the one hand and upon the security of the family on the other.

For a long time this relationship between poverty and disease has been known. More recently through the National Health Inventory we are able to measure this relationship in exact terms. From these records, it is clear that the one-third of our population ill fed, ill housed, ill clothed also is ill provided with the opportunity for health and life. Illness among persons on relief is 57 per cent higher than among those in comfortable circumstances. The case rate of chronic illness among those on relief is 87 per cent higher than among those with comfortable incomes. In relief families, 1 in every 20 family heads is unable to work because of illness, while among those in comfortable circumstances only 1 in 250 is similarly disabled.

Six million people in the United States are unable to work, attend school, or pursue their usual activities on an average day during the winter months on account of illness, injury, or because of gross physical impairment resulting from disease or accident. Two and one-half million of these are disabled because of chronic disease and permanent impairments. The amount of medical service varies inversely with income. Physicians' services per case of illness were approximately 50 per

* Address before the Children's Bureau Conference on Better Care for Mothers and Babies. Washington, D. C., January 17, 1938.

cent less for relief families than for the higher income group.

By doing what we know how to do to improve the health of this underprivileged group we have the best opportunity of breaking the vicious circle of poverty, ignorance, and disease. Poverty increases disease, which in turn engenders fresh poverty. Until the economists have given us knowledge wherewith to produce and distribute a national income sufficient to provide for the minimum needs of every family, we can at least provide a more equal opportunity for health.

Only a feeble start has been made toward that goal, but I would discuss with you the steps which seem urgent for us as a nation to take in that direction.

A start was made in the evolution of a national health program when the Social Security Act went into effect 2 years ago. Through grants-in-aid to states for maternity and child health, for the care of crippled children, and for general public health work, a real stimulus was given to improved health conditions throughout the country. For the first time it has been possible to appraise the health needs of the several states and communities. The amount of federal aid now invested in national health represents approximately 10 per cent of the total cost. The actual amount of money, less than 13 million dollars, is small in comparison with what government is spending for the end results of health neglect, for the results of untreated disease which load our pension rolls. For example, pensions and care for the syphilitic blind cost 10 million dollars a year. Institutional care of those made insane by syphilis costs another $31,400,000.

The time seems opportune to expand the federal government's participation in a broad national health program to include: more effective measures for the protection of the health of mothers and children; the organization throughout the nation of comprehensive measures to cope with those large causes of disease and death for which science has given us weapons of unquestioned power, the provision of the additional hospitals, sanatoria, health centers, and other physical facilities which are necessary and now are lacking in many areas; and better medical services for the medically indigent and the dependent groups of the population.

Such a health program for the prevention of disease and for the better care of those individuals unable to provide it for themselves will bring measurable reduction in future costs of dependency and disability. Without such measures children will need support because their mothers die needlessly in childbirth. Unnecessary deaths from tuberculosis will create additional dependent families. Poorly treated syphilitics will continue to fill our insane asylums and load our relief rolls.

The 12,544 mothers who died as a result of conditions of pregnancy and childbirth in 1935 do not represent the whole of the loss from childbearing. In the past it seems clear that we have underestimated the size and scope of the problem, for there were more than 60,000 babies who died within 2 weeks after birth; there were 77,119 recorded stillbirths. In other words, there occur in the country each year more than 150,000 deaths, 60 per cent of which are due to our mismanagement of the childbearing function.

Economically, children are more valuable now than ever before. The birth rate per 1,000 population continues to decline from 25.1 in 1915 to an estimated 16.5 in 1937. This decline of one-third in the birth rate means that 1,079,000 fewer living babies were born last year than would have been born if the rate had remained at the 1915 level.

We have an ageing population. We have a population which, if present and

past trends continue, will become static within three or four decades. Inevitably our gross death rate will increase. This is to be expected and is not so much a cause of concern as the continued and unnecessarily high death rates in early life and from preventable causes.

The best estimates are to the effect that one-half of the 125,000 babies who died last year were lost unnecessarily. At least one-half of the 12,000 mothers who died in childbirth could have been saved.

An analysis of these maternal and infant deaths shows very uneven rates. In Denver, for instance, a study has shown a death rate among babies in families of less than $500 annual income to be 168 per 1,000 live births as compared with 30 in families with incomes of more than $3,000. Deaths from childbirth among Negro women were nearly twice as high as among the white. (There are 9.6 deaths of Negro mothers per 1,000 live births compared with the white rate of 5.4.) Negro babies die at the rate of 88 per 1,000 live births compared with the white rate of 53. Nor has the Negro shared in the health advances of recent years. Since 1920 Negro males between 20 and 50 years of age have suffered a loss in life expectancy of 10 per cent. Among every group which is economically under-privileged, preventable deaths exceeded those among the economically privileged.

For example, in the State of Michigan, no prenatal care is received in 4 of every 10 pregnancies among families on relief, while those in comfortable circumstances get such care in 9 of every 10 pregnancies. Of those on relief, only 26 per cent get *adequate* prenatal care, while of those in comfortable circumstances, two-thirds get adequate care. Yet medical care in Michigan is above the nation's average.

Approximately 1,000,000 children are born each year in families on relief or with an annual income of less than $1,000. Here are found the highest death rates of mothers and of infants; here the least, and the least good medical care. Tax funds should provide the medical, nursing, and hospital costs of childbearing for every woman unable to provide good care for herself. The greatest freedom of choice of the physician should be allowed which is compatible with securing competent service. Such aid would remove an immediate and grave economic barrier to bringing a child into the world.

It would substitute good care under strict professional standards for the haphazard and criminally poor care now being received by so many women. Because they may not have paid the doctor's bill for a preceding childbirth or illness, there frequently is great reluctance on the part of under-privileged women to report to a physician for care early in pregnancy, especially in the rural districts and in those cities where prenatal clinics and free hospital services are not available. Moreover, unless they are entirely destitute and desperate they shrink from going to the welfare officer for aid, because of the stigma surrounding an application for public relief. I propose that public aid for the medical, hospital, and nursing costs of childbearing be put upon the basis of the medical need rather than be measured by the yardstick of a pauper's oath.

Health supervision during infancy and childhood is needed for this same group of the population. In the schools the training of children should include much more attention than we now give to proper nutrition, to full physical development, to the correction of defects, and to training in correct health habits and attitudes.

That tuberculosis is a battle half won should spur us to win the remaining half. The broad averages of 56 deaths

per 100,000 population hide rates among unskilled workers 7 times as high as among the professional groups, and among the colored in the young adult age groups nearly 10 times the white rate. Isolation of active cases in sanatoria has been the keystone of the tuberculosis control movement. Yet in 26 states, there is less than 1 bed per annual death. To provide for the whole country the accepted standard of 2 beds per annual death would require an additional 50,000 beds for the care of the tuberculous. To do the case finding, perform skin tests, make X-rays on positive reactors and on home contacts, and utilize collapse therapy more widely, will require the mobilization of tuberculosis control forces on an unprecedented scale in whole states and sections of the country where now death rates are high and little or no action is being directed against them. In these same areas one finds the most meager financial resources. Substantial federal participation in this campaign is the opportunity of any administration sincerely concerned in helping the under-privileged. By a concerted national effort against tuberculosis there is reason to believe that this disease within a generation can be reduced to the present negligible proportions of typhoid fever.

Syphilis is another disease as serious as tuberculosis and even more devastating in its economic and social effects. Against it we have cheaper methods of case finding, surer methods of arrest and cure, and a method of chemical quarantine which will promptly prevent spread. Yet the battle against syphilis has just started. You who are concerned primarily with the health of mothers and children have neglected for long years this most easily preventable cause of stillbirths, of sickly, deformed infants, of broken homes. The 60,000 babies with congenital syphilis born in this country each year can be the first major health hazard of the next generation to be removed. To do this we need only to transfer some of the effort and cost now spent in the care of late results of syphilis to the finding of early cases, sources of infection, and contacts, and to providing them with adequate treatment. That this must be largely a public obligation is shown in recent data collected by the Public Health Service. About one-half of syphilis cases now are treated in clinics, the other half in doctors' offices. Of those whom the doctors treat 28 per cent have an annual income of less than $1,500—insufficient, all will grant, to pay for subsistence for a family plus a complete cure. Opportunity for cure within the means of the patient is a first necessity. Syphilis control is a national problem. A national conference of experts last year recommended a federal expenditure of $25,000,000—half a battleship a year—which in my opinion would give this country greater security than the same amount spent for armaments. Let us add to this a law in every state requiring freedom from infectious syphilis as a precedent to the issuance of a marriage license. It is devoutly to be hoped also that you obstetricians can improve obstetrical practice in this country to make a blood test early in every pregnancy as routine as is the putting of antiseptic drops into the eyes of every new-born baby.

Only recently and in a few states has pneumonia been accepted as a public health problem. Taking a toll of 100,000 lives each year this disease ranks next to heart disease and cancer as a cause of death. Many of these deaths represent terminal conditions among the aged. How many are due to the pneumococcus we do not know. We do know that a large proportion of the pneumococcic pneumonias are caused by those types of organisms for which we

have an effective curative serum. We do know that the death rate from pneumonia is 3½ times as high among unskilled laborers as among professional groups. We do know that of the deaths under 1 year of age, 20 per cent—1 in 5—are due to respiratory infections, chiefly the pneumonias. We do know that the prompt typing and the use of serum for appropriate cases will cut mortality in half. Yet in nearly every state the basic laboratory facilities to type the disease are not generally available. In all but 2 states, curative sera are not to be had by any except the minority of patients able to pay from $50 to $150 for this life-giving remedy. Of every 2 cases treated with serum 1 life can be saved. Is it worth the cost? Here again public provision of these essentials of life are needed on a national scale if we are to reduce the toll of pneumonia deaths.

In the control of cancer we have less exact, less effective tools. Yet before a committee of Congress last year, experts testified that if all cases of cancer received the type of good treatment now available in a few cancer institutes, we could reduce the present toll by at least 20,000 annually. To do this will require a national effort. It will be necessary to establish treatment centers, train expert staffs, provide radiation therapy, and make the services of these centers available to those sufferers unable to pay for the expensive care required.

Persistent, coördinated, systematic research is essential to future cancer control. Congress has recognized this by establishing a National Cancer Institute under my direction with an annual authorized budget of $700,000 to accomplish this purpose, and to bring the best available knowledge to the help of the present cancer victim. Ways and means of accomplishing these purposes are being worked out with the help of the best minds in the country.

For many other diseases such as malaria and pellagra, we have known but unused methods of prevention.

For others such as acute rheumatic fever, influenza, or cancer, persistent and systematic research is the first need, in order to develop effective methods of control.

In this discussion of our major national health problems and the ways of dealing with them you will recognize an underlying theme: Good treatment, early treatment, means prevention of other cases, and means prevention of death or serious disability for the patient. In fact, one can make the general statement that prompt restoration of an individual to health is an essential part of any complete regime of prevention. Whenever any disease is so widespread in the population, so serious in its effects, so costly in its treatment that the individual unaided cannot deal with it himself, it becomes a public health problem.

Better care during pregnancy and childbirth, protection of the health of children, good nutrition and sound physical development in youth, protection against the acute communicable diseases, control of tuberculosis, syphilis, pneumonia, cancer and other catastrophic diseases, all assume an importance to the community as a whole. The taxpayer now has a financial stake in good health for all. He pays for its neglect in pensions, in relief, and in institutions for the care of the end results of unprevented disease and untreated illness, and in the economic wastes of early, needless death.

I have discussed the measures needed against specific diseases and conditions of national importance. To put these measures into effect we need a reorientation of our public health machinery. We need to build upon the skeletal forces we now have, health organizations in every community able to cope with these new and larger health problems.

We need to coördinate, to integrate the facilities now available—the hospitals, the practising physicians, dentists, nurses, social welfare agencies, in fact, all of the professions and agencies directly concerned with good health. This can be done without any basic change in our present system of medical practice. In fact, much of the public effort will be directed toward making available better tools for the use of the practising physician as a step toward providing necessary facilities for health.

Many areas at present, however, are lacking in the basic facilities requisite to good health. I have referred to our deficiency of tuberculosis hospital beds. May I call attention also to the 18,500,000 of our population living in 1,300 counties with no general (registered) hospital facilities whatever? We do not need a general hospital in every county, but even the minimum standard of 2 beds per 1,000 persons indicates a need for an additional 22,000 beds in rural areas.

Care of the mentally sick is still on a primitive basis in many states. Domiciliary care, little medical attention, no use being made of newer methods of treating general paresis and dementia praecox, is the rule. We need additional beds for mental patients but more than that we need to provide a mental hygiene program to replace the present insane asylum attitude in the care of the mentally sick. Such a change would in future years measurably reduce the load which now burdens all of us.

Many communities lack the laboratory aids to medical practice which modern science indicates are necessary if we are to apply present medical knowledge effectively for all the people. Public funds are needed to provide laboratory services not now available.

Local health departments typically are housed in the basements of city halls or county courthouses. The newer concept of public health can be more easily put into practice through physical facilities such as health center buildings. Frequently these can be combined with small community hospitals. Many new post offices have been built. With federal aid thousands of new schools have been built. Let us now provide needed hospitals, sanatoria, mental hospitals, and health centers.

Having provided services for those diseases and conditions which are of particular public health importance, and the physical facilities needed for efficient health work, there still remains the lack of general medical care for dependent groups of the population and for those in the marginal economic groups. The evidence is clear that they now get inadequate care. Yet since the time of Queen Elizabeth the idea has been written into the laws that medical care of the indigent is a responsibility of society equal to the responsibility of providing them with food, shelter, and clothing. This idea still lacks application.

We have seen that those on relief have a 50 per cent excess of acute illness and nearly twice the amount of chronic illness experienced by those in the comfortable economic group. Others in the marginal economic groups have the next highest rate and many of them will later be burdens to society because of preventable disease or remedial defects. Many of these illnesses are not curable with present medical knowledge, yet even for them medical care is a humane measure of relief. For a large proportion, medical care will restore health and employability. The returns in reduced relief loads should be enough to pay the cost of the whole job of giving medical care to the dependent groups of the population. Again, a fundamental program seems needed to do this job (with the cost shared by federal, state, and local budgets) which will provide general medical care for the dependent groups of the population.

Our existing structure of social security provides old-age pensions to the needy, unemployment insurance and old-age annuities to soften the impact of job loss and old-age destitution; aid to dependent children and the blind; and the beginnings of a preventive program in public health, maternity and child health, and aid to crippled children. To this base I propose we add a real, nation-wide, result-getting health program which would provide: (1) for all citizens those community measures of sanitation and disease prevention which are necessary if any of us are to be safe; (2) for the underprivileged third of our population, such specific measures of prevention and treatment as good maternity care, child health protection, the control of tuberculosis, syphilis, pneumonia, cancer—conditions which are too important to the nation as a whole for us to permit continued neglect; (3) for areas without them, the physical facilities for good health such as hospitals, sanatoria, and health centers without which no national health program can operate effectively; (4) for those on relief and dependent upon public funds for the other necessities of life, a minimum standard of general medical, dental, nursing, and hospital care.

In my opinion, the major cost of this program should be borne by local and state funds with federal assistance. The health program should be under local operation, adapted to the needs of the community, with state supervision and federal guidance and aid particularly to insure minimum standards and to equalize the financial burden. A program such as this costs money, large sums as compared with present expenditures for health, but small as compared with the cost of continued neglect. It will be a wise investment of public funds. It will pay dividends in a more fit citizenship, a less dependent citizenship.

Up to now we have been so busy bailing out the boat that we have neglected to calk up the seams. Let us put first things first in national planning for a more prosperous nation, a more healthful nation, a sounder national economic structure.

A national program of health is essential to any national plan of rehabilitation. It will pay dividends in dollars no less than in human lives. Savings to the nation's economy will be apparent immediately. Savings over the next decade will easily amortise every dollar spent.

May this Conference draw the blueprint for a comprehensive program upon which we can build a sound structure of maternity and child health, and integrate it with the whole composite of a national health program, which is essential for health security, for economic security, for the security of our democratic institutions.

As doctors we have been too closely concerned with gross pathology, too little concerned with positive health—which means much more than freedom from obvious disease. Other nations are making strenuous efforts to produce a generation fit for war. Surely we need no less a generation physically fit for the pursuits of peace.

Essentials of an Effective State Plan and Program of Activities for Flood Sanitation*

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THE location of Illinois in the Ohio River basin places her in a more fortunate position than that of some of her neighbors when it becomes necessary to prepare for flood waters with their resultant destruction, in that a longer period of time must elapse before the river's crest reaches Illinois borders. On the other hand, being at the river's mouth, this state bears the full fury of its flow after being swelled by water from the tributaries which enter it before it joins the Mississippi River at Cairo. In the 1937 flood, forewarnings were available and were heeded, but the unprecedented flows counterbalanced in a measure the good which, under normal flood flows, might have been expected to result from forecasts. However, the ability to anticipate and prepare for a catastrophe such as this is of the greatest importance, even if the time gained for so doing is less than that desired.

Experience is a good teacher but learning lessons at the expense of the public health is too costly. Therefore, it behooves us to profit by the experiences of others and to avail ourselves of the facts learned in a task of the magnitude facing those in Illinois following this flood. The successes and failures resulting from the execution of the program in this state teach valuable lessons and this paper is prepared for the benefit of those who may find themselves in a parallel situation at some future time. It does not recount incidents, suggest procedures or outline a plan based on hypothetical conditions, but rather on a variety of real occurrences which cover all phases of flood sanitation work.

EXTENT OF FLOOD

The entire gamut of flood problems fell on Illinois early in 1937. There were sudden breaks in levees inundating, within a few hours, municipal areas and large stretches of farm lands, and also there were slow rising waters which gave ample time for the preparation and effecting of some remedial measures. Municipalities many miles away from the Ohio River were flooded by encroaching backwaters. Some towns were completely covered, others

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High Water at Harrisburg

partly so, and one, in its outskirts, leaving a high center as an island. Other states had larger cities with greater populations under the same flood but they had more and better facilities of all kinds with which to meet their emergencies. In Illinois, the many small communities lacking adequate municipal organization, equipment, financial resources, and communication and transportation facilities, presented relatively more difficult problems.

Health and sanitation work could not be concentrated in a small area but had to be spread over a considerable territory. The southern part of Illinois is comparatively flat and low-lying and consequently the river at its crest was able to reach 10 counties and cover 978 square miles. Such an extensive area included many communities and settlements. Unfortunately for flood sanitation operations, this section is lacking in railroad connections and paved highway mileage. As compared to area, the population stricken was small, being only 35,100, but as it is a population of home owners and renters, many people suffered. Although this section is one in which the incidence of communicable diseases is normally higher than that of the entire state, it is also the general section in which during the last 3 years special emphasis had been given to typhoid fever and diphtheria immunization work.

PERSONNEL

Tornadoes and floods in Illinois in other years provided a certain amount of catastrophe work and experience for the older members of the engineering staff of the State Department of Public Health, but on the whole much of this work had to be done with inexperienced personnel. There were available on the department's staff or on projects with which the department was closely affiliated a group of 29 technical men. This number included 10 who had only recently been placed on duty under the provisions of the Social Security Act; 5 were from the malaria control project then being operated in this southern section of the state; and 3 from the community sanitation project. Un-

fortunately, the district health units formed as a result of the Social Security Act had not reached maximum efficiency and this limited their usefulness, but this emergency confirmed the value of decentralized health work and the suitability of units such as are being organized here to intensify public health work in political subdivisions smaller than a state. The engineers from the malaria control and community sanitation projects were of great help because of their familiarity with this part of the state and their knowledge of the persons who could be of most use in work of this kind. Other departments of the state furnished 6 men and, through the U. S. Public Health Service, 6 men were secured from other states and cities. The Service also had 5 men on field work here for more than a month.

MOBILIZING EQUIPMENT

Early in this strenuous period and before the extent of the flood could be predicted, the department started to mobilize its equipment. For many years it has had emergency chlorination outfits and, because of the close relations existing between the department and plant operators, other types of equipment were made available. The department's mobile laboratory was despatched to the flooded section and later performed good service with an important saving of time on the water supply work. Consideration was also given to publicity and to the preparation of large numbers of various types of instruction sheets and handbills for distribution among the people.

PHASES OF FLOOD SANITATION WORK

Flood work readily falls into two rather distinct phases: that during the period the water is rising to its crest, and that during the recession of those waters and after they have again withdrawn to their usual courses. With the rising waters, hysteria is inclined to prevail, often influencing the quick decisions frequently needed. Then men are needed who can decide quickly and correctly on the spot what must be done; men who can "keep their feet on the ground" and not give way before all of the suggestions that are made. In the second phase, most of the hysteria has passed but, what is worse, apathy then sets in. While the waters are rising, everyone willingly sacrifices himself to do or give something, but when the mud begins to show there is a tendency for the "heroes of a day" to disappear leaving the slogging work to those more intimately concerned with the public welfare. In those conditions, men are needed who have a driving force behind them and a desire to see a hard job well done, and an endless amount of tact. These qualities should not be ignored in any organization work for they are quite as essential to the success of a scheme as technical ability.

PRE-FLOOD ACTIVITIES

Prior to the time when the Ohio River reached its crest, much effort was devoted to keeping threatened water supply systems in operation, preparing them for inundation and providing temporary facilities which would play a part after the water reached its peak and these plants had been forcibly closed. Eventually 9 public water supplies were affected; 7 being entirely out of service, 1 continuing operation behind 14′ of diked-out water, and 1 other operating under the protection of a levee system, but in the early stages this could not be foreseen. The first department engineers were sent to southern Illinois before any municipality was dangerously threatened. To each public water supply where trouble was anticipated, a sanitary engineer was assigned, and emergency sterilization equipment was

installed. All available private wells and cisterns on high ground in areas contiguous to that about to be flooded were treated with chlorinated lime and, after the quality of the water in them had been assured, were placarded with signs reading "Safe Water—This Water is Being Treated and Kept Safe by the Illinois Department of Public Health." In some instances, barrels and tanks of water were maintained. The ready availability of water of good quality in the high areas was found to be an important factor in controlling water-borne illness when the public water supplies were placed out of service or when refugees had to be moved into those areas.

By contact with relief organizations, the field engineers were often able to learn in advance to what point a community was to be evacuated and then to have ready at that point suitable drinking water and other sanitary facilities. If the area to which refugees were to be evacuated was outside of the reporting engineer's territory, the information was relayed to the proper person through the Carbondale field office. This particular activity could have been materially improved, and much valuable time saved if better prearrangements had been made with the Department of Public Health by the agencies removing refugees. This is an extremely important factor in work of this type if the health of the stricken people is to be guarded. During the latter stages of the emergency, better coördination of this work was secured and it proved the value of all efforts to link together refugee movements and the preparation of sanitary work. During this phase, 490 wells, cisterns, barrels, and tanks of drinking water were supervised and maintained in a cleanly condition by the department's engineers.

In some municipalities, in order to locate wells and cisterns which might be useful when needed, Boy Scouts were employed to canvass areas and locate them. The information they collected was spotted on local maps and utilized at the proper time. It was found that in the chlorination of these small supplies care had to be exercised to eliminate objectionable, chlorinous tastes. If that had not been done, the object of the work would have been defeated because the people would have resorted to other sources of drinking water. A single chlorination of a supply was not found to be sufficient, and constant checking was needed. Wells which were seriously polluted and unsafe for drinking were posted with a sign reading—"Warning: Polluted Water—Do Not Drink."

By anticipating the flooding of a municipal water plant, it was possible to save much equipment. Pump motors were hoisted to high places and other apparatus was made secure. These actions resulted in water works being placed back into operation, after the flood water had gone down, several days earlier than it could have been done otherwise. Another advantage accruing from the assignment of men to areas about to be flooded came through the use of public notices to close off all water lines before leaving property and to give such other assistance as might be helpful after the waters had retired. Even with such warnings, it was found, in many cases, that faucets and taps had been left open and that consequently it was difficult to build up pressures in distribution systems. In one partially inundated municipality with a public water supply, it was necessary to valve off the distribution system in the flooded section.

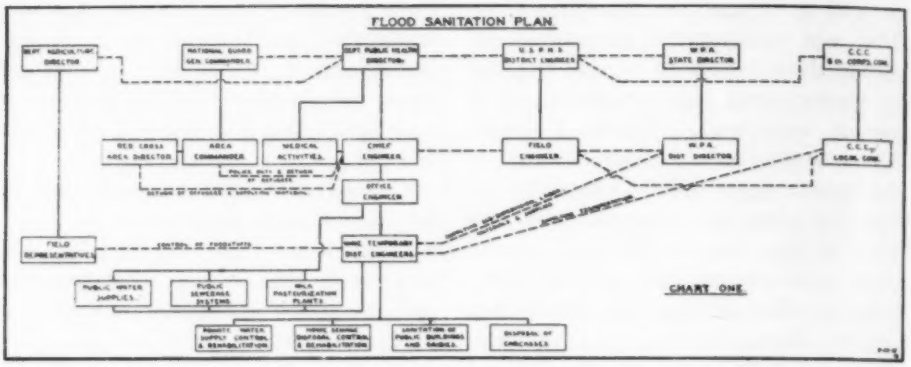
One unforeseen development in flooded sections of cities was the washing away of small homes and the consequent breaking of their water connections. This reduced pressures and quantities especially when it was im-

possible to cut out the disturbing lines. This was counteracted sometimes by guying these houses to nearby trees or by placing sand bags on the roofs to prevent movement. Where a public water supply had an elevated tank on the system, it was filled to capacity before the town was evacuated and the valve at the base of the tank closed. This stored water then was of great value in rehabilitating the distribution system. Adequate plans of local water lines proved their value in these situations.

In connection with meeting water demands, another problem arose which had not been foreseen. The transfer of refugees into small municipalities placed excessive burdens on both the water and sewage disposal systems there. The population of some of the smaller receiving towns was increased many times above the normal over night, and it was found that the sanitary facilities were not of such capacity as to accommodate this sudden growth. In some cases, refugees had to be moved from one location to another to relieve these burdens. It is believed that such conditions could have been avoided through more thoughtful planning and closer coördination of the relief agencies with the State Department of Public Health.

One city presented a special problem because a high portion in the center was not flooded but the environs were completely covered, creating a central and inhabited island. From previous experience, it was known that to control water-borne diseases adequately, safe drinking water must be brought to the very door of the consumer. Hence, that was done in this city by securing tank trucks of water at the nearest safe public supply, transferring it to milk cans, at which time it was chlorinated, and then barging it to the unflooded sections of the city and distributing it by truck. Each truck had a definite route much like a milk route, and the citizens were informed through the local radio station that upon arrival of the water truck they would be permitted to secure an adequate quantity (1 gallon per capita per day) for

Barging Safe Drinking Water Into Harrisburg



domestic consumption. Special trucks supplied hospitals, hotels, and other public places. In addition to the importation of water into this community, the total supply was augmented from private wells which were being constantly treated to insure their safety. In order to reduce the use of drinking water, barrels or tanks of untreated water were placed at convenient points throughout the city so people could take it into their homes for flushing toilets.

Besides providing people with safe drinking water, much time was devoted to the care of the refugees. It was soon learned that the Red Cross did not have sufficient technical, supervisory personnel to control sanitation adequately in their far flung camps. Therefore, under an arrangement with them, this work was taken over by the state. Certain groups of camps were assigned to several engineers as their particular responsibility. It thereupon became their duty to see that all sanitary measures essential to safeguarding health were applied and that each camp was maintained free of debris and litter; that toilets and other sanitary devices were kept clean; and that dishwashing methods were as satisfactory as they could be made under the existing conditions. In one instance, the department's engineers supervised the installation of an entirely new water system for a large tent camp. Although this activity was not foreseen, it turned out to be an important one which continued all through the emergency and until the refugees had been returned to their homes.

PLANNING POST-FLOOD SANITATION MEASURES

A large proportion of the work already described was carried on before the flood waters started to recede. The largest task still remained. Governor Horner foresaw what would be left after the waters went down and, in partial preparation for it, called a conference of the heads of the interested state departments and representatives of the U. S. Public Health Service. Based on the discussions at this meeting a post-flood sanitation program (Chart 1) was devised which was the most complete and extensive ever attempted in Illinois. In this program it was recognized that many agencies would be striving to give aid where it was needed, but that unless they were in some fashion coördinated, effort, time, materials, and supplies would be wasted, and the ones needing help would be that much the losers. In this effort, the U. S. Public Health Service was able to be of service.

The rôle of the Service was thought to include three principal activities: (1) coördinating the efforts of all of

the federal agencies at work with those of the State Department of Public Health, (2) making available to state personnel the results of experiences with other disasters of like nature, and (3) supplying field personnel of the categories desired to augment that of the state. Without some one tying together the plans of the many different groups then in the flood area, success could not have been attained so smoothly. In Chicago, the Service's District Engineer maintained telephonic contact with the field at all times. By remaining there, the health workers in the field had a representative on the job when it was necessary to secure decisions from the Works Progress Administration, the U. S. Army, or some other federal branch whose field representatives could not make them. Speed in this type of work is important and any undue delays ungear the entire operation. He was able to speed up the transmission of supplies and to secure tank cars of safe water which were spotted at the neediest places for subsequent use. In the field, the Service had another engineer (A.P.M.) whose time was devoted to working with the state and to harmonizing the activities of all other federal agencies on this job with those of the state.

As to personnel, the Service was able to supply, through its District Engineer in Chicago, all of the additional help as it was needed. This was made possible by the early creation of a reservoir of persons whose services were promised if a need for them arose. This plan had great flexibility, for it was unnecessary to request help until it was really needed when it was known that sufficient technical assistance was in the background and would be despatched quickly upon call.

ESSENTIALS TO SUCCESSFUL PROGRAM

Four essentials in the conduct of emergency work of this character might be stated as (1) a centralized headquarters within or adjacent to the stricken area in which the director of the work or his executive shall be ready to respond to inquiries at all times, (2) a decentralized working field force with sufficient supplies and transportation, (3) complete harmony among all agencies working to the same end, and (4) frequent and constant liaison between the working field force, the coordinate agencies, and the director's office. In Illinois, all of these essentials were present and maintained throughout the work with a high degree of efficiency.

At Carbondale, the malaria control project office was ready and waiting when this emergency arose. It was happily located with respect to the territory subject to flooding and to the central offices of other groups; well equipped as to office appurtenances and telephones; and conveniently located as to highways and other transportation facilities. Its equipment was supplemented by a telephone service to the nearest headquarters of the state highway patrol and a short-wave radio sending station, and a short-wave receiving set. As a concentration and distribution point for both personnel and supplies, it was a satisfactory location. Its connection with the highway patrol was very helpful because that group performed yeoman service night and day during the earlier phase. The radio sending and receiving connections were of inestimable value because during the period of extreme high water the only method of communication from some points was via the air. At this office, the authors maintained their headquarters for more than a month. In addition, an executive engineer from the state staff was present all of the time with all necessary stenographic and clerical aides. This office was open 24 hours each day. Here a large wall map built up from U. S. Geological

Survey quadrangle sheets was maintained to show high water levels. This was very helpful in planning field work and predetermining breaks in highway communication. To this office, all incoming personnel was sent to receive instructions and directions before advancing into the flooded zone. All medical activities centered in this office also.

A decentralized field force was secured by establishing 9 temporary districts to cover all of the flooded area (Chart *2*). Each had a sanitary engineer in charge and all were responsible to the chief engineer. Eight of these districts were coextensive with 8 counties while the 9th embraced parts of *2* counties. Inasmuch as these temporary district engineers had to secure their labor force through the WPA's local engineer, the headquarters of the sanitary districts were established at the same points as those of the WPA county engineers. This method was very beneficial in that it permitted these two engineers in each county to work in close harmony. In some cases, the sanitary engineer made his headquarters in the same office as the WPA engineer. In addition to the engineers in charge of the districts, there were others assigned to work under their direction. The number of engineers was varied in each district in accordance with the needs, and as work decreased in volume in an area, surplus assistants were shifted to another district. In general, in each district there were sufficient engineers so that the work could be sub-divided into the 4 special activities shown on Chart 1.

All sub-supervision, labor, materials and most supplies were furnished by the WPA. The CCC established local bases for truck trains throughout the area (see Chart *2*) in suitable parks and within truck-travel distance of operations. With these they undertook to furnish transportation until other facilities became available. When trucks were not in use for military purposes, the Illinois National Guard (see

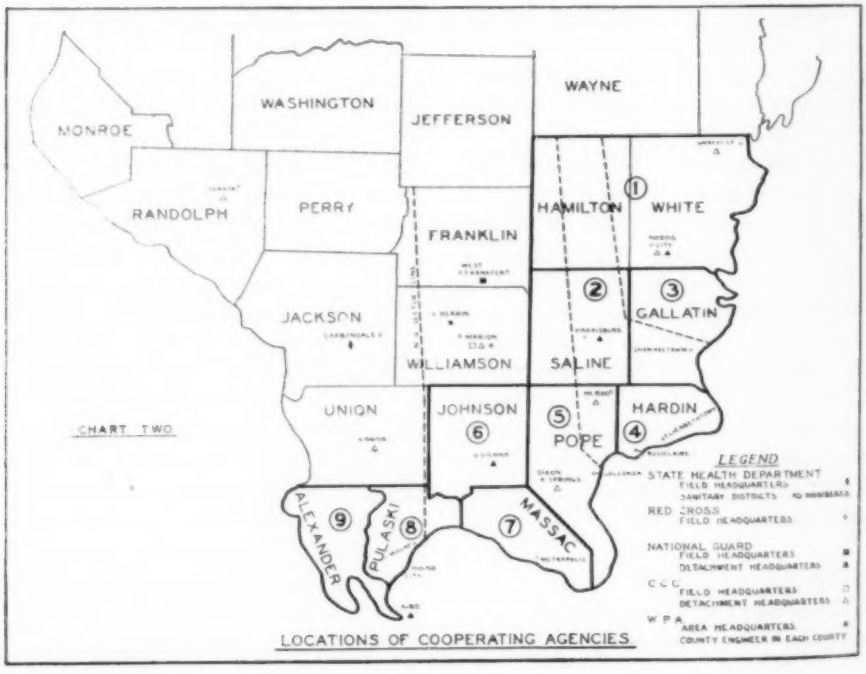


Chart 2) also helped perform the many tasks requiring hauling.

Coördination between all of the agencies engaged in the same task was secured by preparing a plan of work (Chart 1), explaining it to each agency and then through daily visits to them. Each agency was kept informed by a daily memorandum of any new policy and of the status of work.

Liaison was maintained between the field staff, all other agencies, and the directing engineer's office by meetings, telephone, telegrams, and radio. During the first phase of the work—before the flood had reached its crest—every key man in the field would telephone or radio to the field headquarters at a prearranged time and report conditions in his area, receiving at the same time any necessary instructions for the next day. This scheme eliminated any "free lancing" by personnel; kept the program of work under one person's direction; assured complete coverage of affected areas; avoided duplication; and permitted a flexible distribution of men and supplies to meet the needs. This conference generally took place late at night, and before morning the information received from all those reporting had been put into a complete statement and sent to the main office of the State Department of Public Health, the District and Washington offices of the U. S. Public Health Service, and all other agencies in the field such as the Red Cross, WPA, National Guard, Coast Guard, CCC, and U. S. Army. These reports not only gave a résumé of accomplishments to date, but indicated refugee movements and pointed out other matters of use to the coöperating agencies in their fields of activity. Incidentally they made a connected history of activities during the entire period under discussion.

Besides nightly reports, weekly meetings (at night) were held in the field headquarters. To these came the temporary district engineers and representatives from all other groups. The difficulties of operation such as securing labor, supplies, and equipment, were discussed and settled here. Some controversies were fiery, but to the credit of those involved, all questions were eventually settled to the benefit of the work at hand. This clearing-house of troubles was extremely beneficial. It is difficult to see how such a group of agencies could have worked together without some such common meeting ground.

DETAILED PROGRAM FOR FIELD WORK

A plan for a task of this scope and magnitude must be subject to change to fit unforeseen conditions. Chart 1 shows the organization of the work as it really functioned, including all changes made during its progress. There were four objectives, namely, (1) rehabilitation of public and private water supplies, (2) rehabilitation of sewer systems, and the provision of methods of wastes disposal at homes, (3) cleansing and reconditioning of public buildings, schools, dairies, and milk pasteurization plants to such an extent as to place them in the same condition as they were prior to the flood, and (4) disposal of carcasses and other decaying matter. Cleaning of private homes was held to be the responsibility of the owner, but advice was freely given through various media.

Facing this task it looked appalling in extent. Much pioneer work had to be done and many lessons were learned through successes and failures. One point definitely established was that clean-up work must commence promptly upon the recession of the waters and then follow closely behind them. Publicity was given to the proposed program through the press and the radio. Several times during the work, special phases of the activities were publicized

through the assistance of various cooperating groups; handbills and bulletins of instructions were distributed in isolated areas and were tacked on the outsides of homes or other buildings where they could be readily seen by returning owners; and any other useful means of conveying warnings was used when possible. These instructions emphasized the need for boiling drinking water. In all flooded towns, handbills were tacked at the entrance of the homes, on telephone poles, and at other conspicuous places, warning the citizens that drinking water should be boiled until public approval of the local supply had been given. Brief bulletins explaining the need for care in securing water, about the proper disposal of human wastes, and regarding the use of flooded foodstuffs had been prepared in advance and were used generously.

PLANS MATERIALIZE

Each district functioned much like each other one. Every morning the various crews of WPA men met with their foremen at designated points to receive instructions from the subengineer in charge of each activity. CCC trucks were available to move workmen and supplies to that day's destination. Generally, the first task after the water receded was the collection and disposal of carcasses. The smaller ones were usually buried where they were found or close by, but larger ones had to be dragged or hauled to lots where crews of men had been set to work digging trenches. It was important to bury carcasses just as soon as they were freed from the water. Little success was had in burning them, but rendering works collected some. Five hundred large animals—cattle, horses, and mules—and 5,100 small animals—chickens, dogs, cats, and pigs—were handled.

Each temporary district engineer had received instructions concerning the disposal of bodies of human beings. However, not one was found nor were there any drownings recorded in Illinois as a direct result of high water, though several persons lost their lives while being transported to and from their work in boats.

The rehabilitation of water supplies in the unwatered areas was carried along at the same time as the disposal of the carcasses. Crews of men with foremen were trained for this work. It was found to be impractical to start pumping flood waters from open wells too soon because of the high level of the adjacent ground-water. This was learned, however, only after the walls of several dug wells had collapsed when the water within them had been withdrawn. Just as soon as soil conditions permitted, this work went forward by the use of portable gasoline pumps mounted on trucks for large wells and cisterns, and hand pumps or buckets and ropes for small ones. The aim was to replace a well in a condition comparable with that which existed before the flood, but it was found that the thorough cleansing given to them exceeded that objective. Very few drilled or driven wells were encountered in this area.

In working on dug wells, due regard was given to the physical hazard of entering them and written permission was secured from an owner before any pumping was started if there seemed to be any possibility of the collapse of a nearby structure. Each finished water supply was tagged, giving the date of the work and name of the supervisor handling it, not for the purpose of conveying information on the purity of the water but to avoid duplication. Along with this program, it was possible to carry on some good educational work because frequently owners observed a squad at work and noticed the improvements that were being made. Ap-

Pumping Out a Flooded Well

preciation was expressed by those who were being helped for the type of service which the department was giving. A record was kept of the type, location, and ownership of each well pumped, with the idea that after the emergency had passed considerable useful follow-up work could be done. A total of 5,400 wells and cisterns were pumped, disinfected, and recommendations made for needed physical improvements.

Most of the temporary districts had within them public water supplies which needed reconditioning after the flood waters had returned to their courses. Emergency sources of power had to be secured in some cases to do this and for that purpose tractors and portable gasoline engines proved useful. In one plant, mixing was done by the use of an outboard motor. Disinfection of water mains was essential and for this service the department was fortunate in securing experts from the city of Chicago's Division of Water Purification. Excessively high chlorine residuals were carried in distribution systems for several days. This served the twofold purpose of sterilizing the mains and of making available to the people a supply of water for washing their homes which had a disinfecting quality. This latter condition had not been planned but many citizens indicated appreciation of water with such a bactericidal effect. After carrying a high chlorine dosage in the mains for several days, it was reduced to normal, and bacteriological examinations were made of samples from the system in the mobile laboratory. If these showed further chlorination necessary, that was done.

With respect to waste disposal facilities, it was originally planned that upon the recession of flood waters, squads of men would provide temporary pits in the rear of residences which had no sewer connections and whose privy buildings had washed away. Instructions regarding the use of such crude facilities were to be tacked on or in each house if the residents had not yet returned. Following these measures it was then proposed to rehabilitate the privies as rapidly as possible. While this plan appeared feasible and appro-

priate, practically it was found to be unworkable. The ground which had been covered with water was so soaked that temporary pits could not be made proof against caving and hence facilities could be provided more quickly by placing reconditioned privy buildings over old pits. Every attempt was made to replace privy structures as they had formerly existed, but there was unquestionably some mixing of buildings. This part of the program was very difficult to administer for many buildings had been entirely washed away or broken up and many pits were left without covering buildings. As a safety measure, pits without buildings were covered with boards or designated as dangerous in some striking way. Due to the failure to secure adequate new material, plans for the construction of new privies on a large scale through the full use of the community sanitation project forces never materialized. However, 3,650 privies were reconditioned and reset.

In municipalities with sewerage systems, cleaning, rodding, and flushing of them presented a separate problem, but it was successfully surmounted under adequate supervision.

One of the most controversial questions had to do with the unwatering and cleaning of buildings. It was early ruled that this would be undertaken only in buildings which were public and in which people might congregate on occasions. By a rigid application of this rule, this work was in general limited to schools, churches, and hospitals. A total of 127 buildings were cleaned so as to be useable. Removal of mud and debris from streets was assumed to be a local problem and was not included as part of the sanitation program. Promiscuous use of lime was not encouraged, and only one municipality in the area was found to be following this practice. The municipality which had created in its center a high and dry island was struck by a plague of stray animals seeking dry land. No attempt was made by the state to control these as they were not a public health menace at that time. When they became so serious as to be a nuisance, local action took care of them in an expeditious fashion.

The Harrisburg Water Works After 9 Feet of Water Had Withdrawn

When the extent of the flood became evident, emergency orders were given to all municipalities in which refugee camps were located or which were housing refugees that only pasteurized milk should be used. Through the aid of local officials and those engaged in relief work, this action was made generally effective. As a secondary result, the value of milk of this grade in conserving the public health was brought pointedly to the attention of many towns. In Illinois, the control of foodstuffs is a function of the State Department of Agriculture and that department undertook all matters pertaining to damaged foods. However, its field representatives and those of the State Department of Public Health were kept informed of each other's activities and worked in close coöperation. It was found essential for the National Guard to place pickets over rejected foodstuffs consigned to burning or burial; otherwise they were prone to disappear.

An attempt was made through the National Guard to keep people out of damaged homes until they had been restored to a condition not inimical to health, but it was found that the human urge to return home was so great that the plan of control was effective only to a very slight degree. After learning this, provisions were made to care for those wishing to work on their homes so that they could live under habitable conditions.

CONCLUSIONS

Whether the preventive work carried on following a disaster is effective is difficult to prove because of many variables. Furthermore, the history of Illinois contains no flood of the magnitude of that of 1937 and no comparable data are, therefore, available. But the measure of the usefulness of any public health program is the results secured, and it is known that for the flood period, January 20 to April 3, there were in the flooded section of the state fewer cases of communicable diseases than in any prior and similar period when *normal* conditions obtained. It would seem that the medical and sanitary engineering programs must have played some part in the production of this result. From the engineer's viewpoint, it was gratifying to know that no case of water-borne disease could be traced to the flood. Although one case of typhoid fever was reported, it originated in an unflooded part of the state and the patient was ill upon arrival in the wet section.

Fortunately, the combination of temperature and rainfall which produced this flood is rare, but its rarity is no indication that it will not repeat. Two principles of value for future use made themselves evident in this experience: first, that a practical detailed plan is essential, and second, that such a plan made effective through a scheme of well equipped districts can be made to produce results.

SUMMARY

From January 20 to April 3, 1937, southern Illinois was stricken with a flood which covered 978 square miles and vitally affected over 35,000 people. Pre-flood preparation to protect these people from water-borne diseases and provide the maximum in the way of sanitary surroundings was proved to be possible. A plan for post-flood sanitation involving the use of the district or unit scheme and an effective coördination of all agencies at work in the entire area was followed without undue deviations. The fact that the communicable disease incidence in the area under water and during the period under discussion was less than for a similar period when conditions were normal attests to the successful consummation of the plans.

DISCUSSION

F. C. DUGAN, C.E., F.A.P.H.A.
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WE will not attempt in this discussion to cover what should be done by the medical profession, life saving organizations, police, military forces, or relief organizations, but will confine it to the activities in the broad field of sanitation.

DURING THE FLOOD PERIOD

Water Supply—The public water supply is, of course, of paramount importance and no efforts should be withheld to keep it functioning. The area of the community where flood waters have become high and where buildings are being damaged should be cut off from the water supply both for the conserving of water and to prevent contamination of the supply. If in spite of all efforts it is impossible to maintain the public water supply, then arrangements should be immediately made to bring safe water in trucks and tank cars and to use available private sources. Where tank cars or trucks are used they will have to be thoroughly cleaned and sterilized. As a rule, it is advisable to rechlorinate the water brought in in such a manner.

Waste Disposal—Part or all of the sewerage systems will possibly be out of commission, and the immediate construction of sanitary toilets must be undertaken. Arrangements should be made for the collection of garbage and trash, and temporary dumps must be established and maintained.

Milk Supply—In many instances milk pasteurization plants are thrown out of commission and it becomes necessary to bring milk into the city. Pasteurized milk should be brought in in bottles and so distributed where possible. If a pasteurization plant is available, then any milk brought in bulk, either by tank cars or tank trucks, should be repasteurized.

Refugee Centers—When it becomes necessary to evacuate a large number of people from flood areas, it will be necessary to establish refugee centers to house and feed that part of the population which cannot be cared for in private homes. The sanitary conditions in these refugee centers, the cooking and serving of the food must be carefully supervised, and the medical profession must pay exceptionally close attention to any cases of illness that may occur. It is needless to say that smallpox vaccination and typhoid inoculations should be given.

AFTER THE FLOOD

It is, of course, desirable to return the people to their homes as rapidly as possible, but at the same time efforts should be made to prevent them from returning too soon or else the health officials may face a serious outbreak of disease.

It is therefore necessary immediately to organize cleanup forces, and men experienced in plumbing, electric wiring, and gas systems should be used to make the inspections before permitting people to go back into their homes. Instructions in simple language should be printed and distributed to householders whose homes have been inundated as to how the house should be cleaned and dried out.

Water Supply—If the public water supply has been out of commission, then every effort must be made to rehabilitate the plant rapidly, for a large amount of water will be needed in cleanup. Private water supplies such as wells and cisterns should be cleaned out and then chlorinated.

Sewerage Systems—Steps should be immediately taken to investigate conditions of the sewers and to determine what work will be necessary to put the system if damaged back into commission. Naturally if a sewage treatment plant has been put out of commission, immediate steps should be taken to put the plant in a proper condition. Individual septic tanks will probably have to be cleaned out.

Milk Supply—Milk pasteurization plants which have been inundated should be thoroughly cleaned and given a rigid inspection by competent authorities before being permitted to start operation.

Food and Drugs—In such a catastrophe there is always a large amount of packaged foodstuffs and drugs which have been inundated and also a large amount of fresh or smoked meat and vegetables which have been damaged by flood waters or by lack of refrigeration. Immediate steps should be taken to prevent any of this foodstuff or drugs being sold. In some cases, especially, canned goods, a considerable amount can be salvaged if done under proper supervision. Methods of disposal of such damaged foodstuffs present a definite post-flood problem. Maintenance and policing of dumps are a necessity. Incineration is not always feasible. Burying with other refuse and denaturing with all types of inedible materials offer methods of safe disposal. Some types of foodstuffs can be diverted after denaturing to animal feeding or non-edible uses.

Dead Animals—One of the biggest problems in rural areas is the disposal of dead animals. If there are any rendering or fertilizing plants nearby, they will be of great assistance in the removal of carcasses. Otherwise trenches should be dug and animals buried.

TYPE OF ORGANIZATION NECESSARY

Of course the area affected by the flood will determine in a large measure the organization of the personnel necessary to handle health activities. The state department of health would naturally be the organization which would be used as the nucleus and its various divisions should be expanded by the addition of temporary employees and voluntary workers. The personnel from the U. S. Public Health Service and other federal agencies and those loaned by other state health departments have always been considered as working under the state health department in the area affected, and during the past emergency this plan worked out very satisfactorily.

Competent sanitary engineers should be given definite areas and they should work in close harmony with the health officer or health officers in their area, making reports to them as well as to the chief engineer of the state department of health. All sanitary engineers, sanitarians, and water laboratory technicians in that area should report directly to the sanitary engineer in charge, and he is responsible for laying out and supervising their work. It is also necessary that sanitary engineers keep in close touch with city officials and relief organizations who can furnish the labor for cleanup purposes.

Food and drug inspection, condemnation and destruction will naturally be handled by the department which has jurisdiction whether it is the state department of health or some other bureau of the state government. The federal food and drug inspectors who will be sent in will report to and work under that department.

In giving a discussion of this topic in a limited time, it is only possible to touch upon the main points of a general plan. In all probability, details will have to be worked out for each area, for much depends upon the character of the area, the population, and the caliber of the man put in charge of that area.

Visual Education for Schools*

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VISUAL education in its broadest sense includes all learning in which seeing is involved. As the sense of sight is the main street, so to speak, over which impressions from the outside world reach the human brain, it is practically impossible to set boundaries for visual education.

The materials for use in learning through seeing are as limitless as the field it covers. Everything that meets the eye in the outside world is a potential architect of new or changed meanings in the inner world of the mind. What one sees may even give the lie to what one has learned in other ways. But although the possibilities of visual education are limitless, in actual practice learning through seeing is limited.

First, mere *seeing* is not learning or observing. Each one of several people looking at the same scene will receive impressions different from those of any other in the group. An artist's observation of a cornfield, for example, will be very different from that of a farmer's son or a city boy.

"Seeing is believing" is an axiom with a corollary, which may be expressed by saying that "seeing is believing what one is prepared to believe."

The visual education of each individual is limited by the powers of observation and by the particular interest and mental training of each individual. If we wish children really to see certain things they must be given some indication of what to look for, remembering always that what each child sees has been passed through the filter of his personality and can never be identical with what another person sees.

A second limitation placed on the scope of visual education is the *selection* of what is to be seen. There is no question "that visual material is lying all about us waiting to be used." The point is that it is impossible to use all of it to supplement book learning or to motivate desirable practices. Visual material must be selected from the mass for a particular educative purpose, and the purpose is what will determine the use of the material. The sun and moon and stars are visual education materials and how many ways there are of looking at them!

A museum of health for which the children themselves may make or collect the exhibit is a visual education project which has far-reaching possibilities. But before discussing this health museum idea it is well to emphasize the fact that visual education in the field of health presents a far more complex problem than the gathering of material to illustrate factual teaching. It must take into account the

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appearance and the behavior of all individuals who meet the eyes of children—teachers, administrators, parents, physicians, nurses, specialists, playmates.

This visual education problem is peculiar to the teaching of health. In teaching history, for example, the teacher does not need to have an historical face. The people who have faces capable of sinking a thousand ships do not teach history; they make it. But there is no doubt that in teaching the principles of healthful living it is highly desirable for the teacher to look healthy and to be healthy. She becomes an exhibit of what to look like and how to behave, and of what not to look like and how not to behave, which is more effective than anything she may say. If a teacher tells her students not to put their fingers in their mouths and then absent-mindedly moistens her own fingers with her lips in order to turn the pages of a book, no scientific study will be needed to indicate which has been more effective —what the teacher said or what the students saw her do.

It is not only the appearance and the habits of the teacher and of all other people whom her students admire that she must take into account as visual education materials, but also she must consider the influence of the students' complete environment. This involves the coöperation of many different people of varied interests, professional background, and experience—from the custodian who takes care of the school building to the architect who designed it. It involves also the coöperation of parents, city officials, and all others who are concerned with the child's environment away from school.

There is no question that certain factors in the students' environment may detract from health teaching by giving them eye-witness evidence of the fact that precept and practice may live in a state of separation if not complete divorce. For example, many a teacher has been obliged to resort to makeshifts in her endeavor to teach children to wash their hands before eating and after toilet because there were no handwashing facilities in the school. The perfect visual education material for teaching the practice of handwashing is the sight of warm running water, soap, and individual towels in the washroom. Lacking these in a school where children eat their lunches of what possible use is it for the teacher to say: "Always wash your hands with warm water and soap before eating." All other visual education materials, such as bacterial cultures from dirty fingers grown by the children themselves on gelatine or agar media, become insignificant if the children are permitted to see *with their own eyes* that the handwashing facilities in school are either lacking or inadequate.

Although doing has more effect on one's health than studying about what should be done, reasonable people insist on knowing why certain health habits are essential. The importance of visual materials in providing concrete imagery is fully recognized, and high standards for the selection and quality of these materials are being attained in certain fields of education, such as art and history, but high standards in the choice of visual materials in the field of health education have not been generally adopted. There is no reason for this situation and you can do much to create a sentiment and a demand for higher standards as well as contribute practical suggestions for improvement.

It is important for health specialists to become familiar with the fine work in visual education that is being done in science, history, and art classes, and to help leading educators to become conscious of the visual materials

in the health education field which are rich in educational value and which are capable of reaching equally high standards of art and workmanship.

To encourage creative ability among young people and at the same time to develop an appreciation of modern health practices, the building of museums of health by children is being recommended. These will require the coöperation of all school departments, creativeness on the part of the students, and continuous growth in the quality of the exhibits in order to maintain high educational standards.

The museum idea for children is not new. Neither is it new to have children make and collect materials for a museum; but a suggestion which has not yet been carried out is that there be a national child health museum made by the children themselves and kept constantly changing and growing by continuous "feeding" from individual children and local communities. In other words, the national museum will grow from the efforts of each child in coöperation with the community as a whole.

There are infinite possibilities in such a project which may begin in a single classroom and spread from one school and community to another. If the exhibits worked out during the coming year warrant the enthusiasm now evidenced by the educators to whom the idea has been broached, it is not difficult to conceive the ultimate establishment of a national museum to which the best models and those of most lasting significance can be sent. However, the starting point should be the formation of local museums of health. In the development of these, creativeness, coöperation, and continuous growth are the important educational features. Working on exhibits for the museum will not only stimulate the student to fresh creation, but will also make him conscious of the constant state of flux and advance in health matters.

The health museum would capitalize on two interests that are almost universal—(1) collecting materials, and (2) making things. We do not have to create interests for children. They bring them to school. All we need to do is to recognize these interests and give the children an opportunity for expression. As one supervisor states: "When a child comes to school with a loose tooth, there is no reading, writing, or arithmetic which can possibly compete with it in interest, and I consider a loose tooth very important material in school health education." Many children are interested in making a collection of their first teeth as they fall out. A collection of animals' teeth will arouse interest in any school. Various types of shoes may be collected in practically any locality. Little stories about the shoes exhibited may be printed on the labels, giving the dates when they were worn. Collections of different types and sizes and materials of handkerchiefs offer may opportunities for health teaching. An exhibit may be planned to show the evolution of the handkerchief with historical details for the labels such as: "We use square handkerchiefs because Louis XVI issued an edict which read: 'The length of handkerchiefs shall be equal to their width throughout my kingdom.'" An exhibit of the handkerchiefs of today would include soft paper tissues and the cellophane envelopes which are advocated for the bestowal of handkerchiefs both in pockets and in pocketbooks.

In the making of models the child will acquire much valuable health information. The more of this he seeks spontaneously the greater will be its educational value for him. If his bent is historical, he may wish to build a model of a Roman aqueduct; if

modern, he may be interested in showing some phase of the water supply system or the lighting system in his own community. If he likes to read about outstanding men and women who have by scientific research contributed to the advancement of public and personal health, he may wish to dramatize in model form important scenes in their lives. This will give an outlet for artistic as well as constructive ability, and will also acquaint the student with ways of getting needed source material. Making models of aqueducts built in different eras; a series of houses which represent progress in lighting, ventilation, and adaptation to climate; human figures engaged in occupations which illustrate various aspects of preventive medicine and nursing; are all among the possibilities which appeal to the child's dramatic instinct and to his love of construction.

Facility in various crafts, such as wood-carving, weaving, and painting can be displayed to advantage and will give the student a sense of achievement. A project requiring different types of craftsmanship will develop coöperative experience in a class working on the various parts of the model scene.

Before starting to make the models it will often be wise for the children to make observation trips, look up source material, do some historical reading, and collect pictures as guides. The children should be made to feel from the outset that it is their museum, and guidance should be of a directional type and not interfere with their initiative and creativeness.

A child health museum is the type of project in which fathers and mothers will readily become interested. With their interest added to the children's enthusiasm there is the possibility of rousing community action for the advancement of health.

In discussing the practical aspects of this "museum hobby" with city and rural supervisors on the East and West Coast, in Canada, and in the South, enthusiasm for the idea has been unanimous. Each person consulted had some suggestions to offer based on his particular subject interest, or on the environmental stimuli of his state or community.

As vital as a growing health museum may become in a school program it must not, of course, become an aim in itself. The children's own drinking fountains or individual drinking cups, and their own seating, lighting, and ventilation problems are more important than any museum. They present real life situations. If the museum in any way sidetracks the attention of teacher or students from securing the fundamental tools of healthful living, it becomes a hindrance rather than a help.

There are many good references for people who are interested in the museum project as a method of visual education in the field of health.

In *Fortune*, for April, 1937, an article entitled "American Museum" describes a survey being conducted to answer such questions as: What exhibits attract people most? How long do they stand before any of them? Do they read the labels? Certain definite facts have been deduced from this and similar surveys. A dead-end hall, for instance, will not entice so many people as one open at both ends. A good 70 per cent of visitors observe the right-hand side first. Most people don't like a mechanical display that moves all the time, but if they have something to do with bringing about the motion, the exhibit fascinates them. Most people will not read labels under any circumstances.

There are, of course, a great many more opportunities for visual education in the field of health than the building of working models and ex-

hibits for a museum. A partial list of these would include:

Field trips to dairies, farms, water supply systems, health department laboratories, and other enterprises affecting community health

Photographic and printed material

Charts, diagrams, posters, wall runners, lantern slides, film slides, and microscopic slides made and exhibited in school

Health and safety motion pictures and film strips

Window boxes and aquaria

The use of the microscope in exploring the world of the very small

Dramatizations—for which the students make the costumes and scenery—of scenes in the lives of health heroes, of stirring incidents in man's search for health, and of desirable health practices

The making and dressing of puppets and giving puppet shows

In fact, practically all the devices that are used in school as visual aids in the teaching of the physical, chemical, and biological sciences, the social sciences, English, and mathematics also may be used in the teaching of health as a curriculum subject.

The thing to remember, however, is that health depends principally on doing. If interest in the visual aid or in the knowledge gained by using it is not helpful in establishing healthful living as a way of life, then visual education as a teaching technic has no place in the health education of an individual. It may be taken as a fundamental principle of health education, as it is of all education, that each child must be given an opportunity to live at his best. The enrichment of the mind and the sound satisfaction of having a reasonable understanding of the meaning of healthful living are certainly commission enough for making health teaching a part of the curriculum. But to make health a part of life, life itself must supply the materials for use in visual health education.

Valuable references on the philosophy of visual education are *Visualizing the Curriculum*,[1] October, 1936, number of *Progressive Education*[2] which has as its general theme "experience through observation," and the 1937 *Yearbook of the New York Society for the Experimental Study of Education*.[3]

Accounts of practical experience are given in the Addresses and Proceedings of the National Education Association each year,[4] and valuable information is found in the *National Visual Education Directory*.[5]

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Adaptation of the International List of Causes of Death to Changing Needs of the Medical Profession and Public Health Groups*

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THE practising physician and public health worker have long been familiar with the processes of collection of death certificates and the published tabulations on cause of death. However, they do not usually appreciate the serious restrictions surrounding and limiting the reliability of the statistical data on cause of death until they become interested in the details concerning a particular disease.

For almost a century the nations of the civilized world have been working toward the development of a uniform system for reporting causes of death. As a result of international coöperation, the *International List of Causes of Death* has been adopted in most of these countries. This list has now undergone several revisions at successive 10 year periods, and will again be revised in the fall of 1938 for the decade 1940–1950.

The Committee on Accuracy of Certified Causes of Death, a sub-committee of the American Public Health Association, has the duty of inspecting, assimilating, and organizing the various ideas of physicians and health workers as to the changes which should be involved in the revision of the *International List*. Official suggestions for changes to be proposed by the United States for the next decennial revision must be sent to Paris not later than November 1 of this year.

An assumption commonly made by the health worker is that the problem of securing comparable mortality statistics will be solved if satisfactory readjustments can be made in the *International List of Causes of Death*. It is true that such adjustments are essential in order to modernize the List and to bring it into alignment with advances in medicine. However, other factors are involved in the production of statistical comparability of tabulations based upon the rubrics of the List. Among these are such items as: The necessity of keeping statistical comparability over time periods during which the List is being changed; adjustment to the constant growth and change in terminology essential to the expanding field of scientific medicine; correction for inaccuracies in the origi-

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nal notations on cause of death as written by the physician; and the need for a consistent methodology in the selection of the primary cause of death to be tabulated when several causes are noted on the certificate.

PROBLEMS INVOLVED

The fundamental basis for a satisfactory adaptation of the *International List* to the purpose of producing comparable mortality statistics depends upon the accuracy of the cause of death statement on the certificate.

In certain instances, the cause of death is not accurately recorded by the physician due to the necessity of protecting the interests of the patient. One school of thought maintains that a considerable improvement in death information would result if the medical report on the death certificate were made confidential. Such a system exists in Switzerland and Holland. The belief is that if the cause of death information were confidential and used for statistical purposes only, resultant mortality data would be more accurately reported. Experiments were conducted in Westchester County, N. Y., to determine the degree of inaccuracy in the reporting of death from alcoholism and syphilis. It was demonstrated that only about one-half the deaths of these types had been recorded. New York City, at the present time, is considering the possibility of adopting a confidential certificate.

The errors in cause of death due to carelessness on the part of the physician in filling out the death certificate are probably fully as numerous as those arising from his desire for a confidential record. Many times the certificate is written by interns in the hospital, or by physicians uninterested in the accuracy of the facts which they note on the certificate. Correction of carelessness will be purchased only at the cost of constant training in medical schools and medical societies as to the value of accurate death information. Eternal vigilance is essential in the querying of unsatisfactory terminology.

The struggle for more uniform use in medical terminology is unending. In many instances, terms are either vague or colloquial in nature. In connection with this problem, it is the hope of the Sub-committee on Accuracy of Certified Causes of Death to establish a list of approved terms in the next revision of the *International List*. However, there are many non-approved terms in common use by physicians which are more or less synonymous with approved terms. Sometimes the names of operations or therapies are listed in lieu of a statement as to the cause of death. Yet, even though the particular operation might be stated on the certificate, the cause of death is not necessarily clearly indicated.

The accuracy of the cause of death varies from one certificate to another. In some instances, autopsy, operation, or laboratory findings exist which result in a more accurate knowledge of the true cause of death than when a clinical diagnosis only is available. Moreover, there is considerable variation in cause of death statements due to the great difference in the training of physicians.

The fact of duration of illness was introduced on the death certificate in 1930. This was done that it might be possible to obtain a sequence in disease conditions so that the primary disease could be ascertained with more accuracy. However, at the present time, statements on duration are filled out in only relatively few death certificates. This raises the question, to be considered later, as to what would be the best way to ask the questions on the death certificate in order to elicit a causal sequence when multiple

causes are involved in the same case.

The problem of when and how to query causes of death which are inadequately described is most important if comparability in mortality statistics is to be achieved. In the past, many queries have been sent directly to physicians by the Bureau of the Census. Such queries of necessity were mailed to the doctor from 9 to 12 months after he had filed the certificate. This aggravated him in many instances—and justly so. A query at so late a date that the facts of the case are vague is of little value. An attempt is being made in some states at the present time to take over the query function in the state health department. Such queries can be made by the state within a month or two after the death of the patient. An even better solution is to have some physician in the county, perhaps the county health officer, scan the death certificates before they leave the county in which they are filed. Poor terminology on the part of the physician is more easily corrected if the circumstances surrounding the death are still fresh in his mind.

In addition to these considerations involving the accuracy of the original information, there are other factors affecting the statistical comparability of mortality data which are directly linked with the use of the *International List*. Some of these involve changes in definitions of medical phrases or terms, the establishment of approved terms and their synonyms, and the deletion of colloquialisms or vague phrases which are more or less meaningless. In general, this function is that of the Sub-committee on the Accuracy of Certified Causes of Death. Among other items of this nature which the subcommittee must consider is the fact that many conditions in the *International List* are essentially terms for morbidity rather than mortality, and that such terms should be deleted since these conditions do not add to the risk of dying.

After the terms to be used in the list are selected, a real problem arises as to how they should be classified in order to be of the maximum use to medical and health groups. Physicians investigating a particular cause of death and trying to use statistical facts tabulated according to the *International List* frequently find that the rubrics of the List are not satisfactory for their purposes. Obviously, the number of rubrics in the List must be limited. This means that, in many instances, conditions must be grouped together which are only partially related to each other. In general, the procedure followed is to keep certain titles in the List quite specific in character, while others are miscellaneous. Rubrics for miscellaneous categories pool together rare causes of death and conditions which are vague or relatively meaningless from a statistical standpoint. This pooling of terms under certain statistical rubrics frequently involves the misallocation of certain causes of death so that the information cannot be reaccumulated later in a form desired by the physician. For instance, physicians interested in heart feel that death from rheumatic heart conditions is a recognized entity. Yet at present in the *International List* rheumatic heart conditions are separated into several titles and pooled with other terms listed therein.

The problem of what terms should be included in the index of the *International List* is another controversial problem. At present the index is most complete. It includes not only the more or less approved and commonly used terms, but also unsatisfactory ones. This is due to the fact that, regardless of the amount of querying, there are many death certificates which must be coded in some manner by clerks. Code clerks must be instructed

as to what numbers they should give to unsatisfactory terminology when nothing else is available.

Statisticians have a pet grievance of their own with the *International List;* it involves the change in code numbers at a decennial revision. The widespread use of the List by large statistical organizations in health and insurance means that endless confusion results in the coding of mortality data at these times. Code clerks must be re-trained to the use of new numbers. Tabulating difficulties are many if breaks in the continuity of cause of death data are to be avoided.

Still another major difficulty from the standpoint of obtaining comparability in mortality statistics through the *International List* is the method used in the selection of the primary cause of death. In England and the United States, about one-half of the death certificates contain more than one cause. These causes may be related or totally unrelated to each other. Unless uniform methods are employed in selecting the primary cause of death, the results will lack comparability due to this difference in selection. Some countries, like the United States, use a manual which describes an arbitrary method for choosing the primary cause of death. Others, such as England, are developing a technic which permits the physician to select the primary cause.

In order to obtain some idea of the degree of uniformity existing among nations in the selection of the primary cause, the Bureau of the Census mailed a list of two or more causes of death taken from 1,032 transcripts to 46 nations in 1935. The 1,032 transcripts were copies of actual death certificates. They were selected as representative of problems in the coding of the primary cause of death rather than as a random sample of death certificates.

To date, 15 nations have answered the questionnaire. The percentage agreements of the 15 nations with the United States and England are tabled. These relative agreements were computed for all 1,032 deaths, and separately for the 89 infant deaths, 70 puerperal, 54 tuberculosis, and 66 cancer deaths in the series.

Except in cancer, where coding similarity is high, the average percentage agreement in the selection of the primary cause of death is in the neighborhood of 60 per cent. Only in puerperal deaths is the average agreement with the United States significantly larger than with England.

The study indicates that international comparability of mortality statistics cannot be achieved without a solution of this problem.

POSSIBLE SOLUTION TO PROBLEMS INVOLVED

A solution of the above problems should make possible a high degree of comparability in mortality statistics, and consequently, an adequate adaptation of the *International List of Causes of Death* to the changing needs of the medical profession and the public health groups.

The possibility of changing the medical notation of the cause of death on the death certificate to a confidential record is being studied in New York City at the present time. It is likely that this feature cannot be introduced into the mortality statistics of the United States since the death certificate is commonly used as a public document. As a matter of fact, it is not at all certain that better statistics would result if the cause of death statement were confidential. No reliable assay of the increased accuracy of the systems in Switzerland and Holland have been made.

Continued advance can be expected in the establishment of approved terminology for causes of death. Specialized medical groups are coöperating at the

AGREEMENT IN SELECTION OF PRIMARY CAUSE OF DEATH

Nation	*Total Deaths Agreement with*		*Infant Deaths Agreement with*		*Puerperal Deaths Agreement with*		*Tuberc. Deaths Agreement with*		*Cancer Deaths Agreement with*	
	U.S. %	*E.W.* %	*U.S.* %	*E.W.* %	*U.S.* %	*E.W.* %	*U.S.* %	*E.W.* %	*U.S.* %	*E.W.* %
United States	..	62	..	50	..	53	..	72	..	98
Eng., Wales	62	..	50	..	53	..	72	..	98	..
Australia	85	65	89	48	80	60	95	72	94	95
Belgium	46	47	40	44	45	51	47	58	54	55
Canada	61	72	58	73	76	68	89	65	88	90
Ceylon	89	65	89	53	84	44	97	74	95	93
Denmark	59	72	58	60	69	39	61	68	95	95
Holland	56	63	59	56	64	58	49	50	86	88
Italy	58	61	62	59	63	56	74	68	83	90
New Zealand	81	64	81	49	77	37	87	77	98	97
Philippine Islands	83	64	80	53	79	56	87	75	93	93
Scotland	60	59	48	59	63	60	65	81	94	93
Spain	44	48	56	51	41	54	45	51	65	66
Sweden	52	62	56	64	54	38	40	74	79	81
Turkey	40	35	48	49	39	47	43	44	61	63
Un. of S. Africa	50	65	56	63	62	76	57	79	87	95
Mean (Average)	61.7	60.3	62.0	55.4	63.3	52.5	67.2	67.2	84.7	86.1
P.E. of Mean	±2.7	±1.7	±3.3	±1.3	±2.5	±1.6	±3.5	±2.0	±2.4	±2.4
Standard Deviation	15.1	9.5	18.2	7.4	14.0	9.1	19.5	11.0	13.5	13.2
P.E. of St. Dev.	±1.9	±1.2	±2.3	±0.9	±1.8	±1.2	±2.5	±1.4	±1.7	±1.7
Difference in Means	+1.4		+6.6		+10.8		0.0		−1.4	
P.E. of Dif. in Means	±3.2		±3.5		±3.0		±4.0		±3.4	
Diff. in Stand. Devia.	+5.6		+10.8		+4.9		+8.5		+0.3	
P.E. Dif. in Stand. Deviation	±2.3		±2.5		±2.1		±2.8		±2.4	
Coeff. of Correlation	+0.47		−0.12		+0.40		+0.54		+0.98	
P.E. Coeff. of Correla.	±0.14		±0.18		±0.16		±0.13		±0.01	
No. Cases Coded by Each Country	1,032		89		70		54		66	

present time with the Sub-committee on Accuracy of Certified Causes of Death in the selection of such proposed terms. It has been suggested by the committee that, in the next printing of the *Manual of the International List*, only approved terms will be listed under the rubrics in the tabular part of the List, and that these approved terms be set forth in bold faced type in the index of the *Manual*.

It will be possible in the revision of the *Physician's Pocket Reference*, dealing with the use of the *International List of Causes of Death*, to introduce not only a complete list of the rubrics but also an index of the approved and commonly used medical terms. By doing this every physician will have available a list of the approved terms. A more homogeneous notation of causes of death should result.

A study is now being undertaken by the Bureau of the Census to separate all medical terms, good and bad, which

are used in the index of the *International List* into 3 groups: those which are approved by the sub-committee as the most desirable; those which are vague in meaning and undesirable; and those in common use by the medical profession but not on the approved list. Each of these 3 groups will be divided in turn into 2 groups—those conditions which can cause death and those which cannot. When this task has been accomplished the statistics from the death certificates of selected areas will be coded accordingly and the percentage frequency under each international statistical rubric, based upon approved and nonapproved terms or upon terms which can or cannot cause death, will be tabulated. As a result of such a study, considerable knowledge will be obtained as to what terms can or cannot be deleted from general usage in notation of cause of death.

A study of a similar nature is planned for 1940, simultaneously with the introduction of the revised *International List*. The plan is to tabulate all of the important alterations in the List. By doing this, tables can be published in 1940 which will be comparable with both the years 1939 and 1941. A knowledge of the relative change produced by shifting certain causes of death from one rubric to another will serve to bridge the gap between the old and the new practice.

Likewise, when medical groups desire to make important changes from time to time in the content of a particular rubric in the List, they can send such suggestions to the Sub-committee on Accuracy of Certified Causes of Death. The Bureau of the Census is willing to assay the more important of the desired breakdowns for an experimental year. It plans to tabulate such statistics and furnish the subcommittee with information on the amount of change involved if the recommendations are followed.

Whenever possible, studies will be conducted on the effect of autopsy information or the existence of laboratory and surgical findings upon the accuracy in diagnosis of cause of death. For instance, at the present time, the Health Department of Chicago is conducting a special study based on autopsy findings in infant mortality. This has resulted in an advance in the knowledge of the true causes of death in the first year of life. The discrepancies which exist in Chicago mortality statistics as tabulated with and without autopsy knowledge have resulted in a better understanding of these mortality facts. It is hoped that studies of this type will be made from time to time by local groups. However, it is not to be expected that the physician will ever have the advantage of autopsy findings available in the majority of deaths. In fact, the physician is frequently not sure of the diagnosis which he records, although he might be reasonably certain that it is one of two or three conditions. The degree of sureness which he feels concerning his diagnosis as to the cause of death should be recorded and introduced in mortality statistics.

Recognizing the difficulties of obtaining accuracy in cause of death data, there is still room for considerable advancement in accuracy if the cause of death questions on the certificate could be asked in such a way as to elicit the best possible answer from the physician. It may seem a relatively simple matter to formulate the questions as to cause of death in a manner that will obtain from the physician the exact information desired. However, the experience of various countries which have studied this question leaves no doubt that it is a complex and difficult problem. The difficulties arise from those cases which involve more than one cause of death.

Realizing the great importance of ac-

curate and uniform cause of death information, a Sub-committee on the Cause of Death recommended to the Health Section of the League of Nations the adoption of a new form of medical certificate. The recommendations of this committee were made in 1925 and incorporated in a modification of the form instituted by England and Wales in 1927. The United States revised its form in 1930 but disregarded the recommendations of the League of Nations Health Committee. This revised form is the one now in general usage in the United States as the standard death certificate.

The Bureau of the Census in studying suggestions for change in the cause of death section of the U. S. Standard Death Certificate has found that they can be classified into 4 general types. The objections are: (1) that the accuracy of the data depends to a certain extent upon definition of the term "principal cause of death" which is not understood by the practising physician; (2) that the certificate leaves too much latitude for the physician in the selection of causes of death which do not contribute to the risk of dying; (3) that the certificate is solely dependent upon "Date of Onset" for a picture of the sequence of events and to some extent upon this information for a knowledge of the importance of cause of death; and (4) that the certificate is confusing to the certifying physician because it disregards the orderly development of the morbid conditions preceding death.

In order to illustrate these practical difficulties, an example is cited:

A woman 70 years of age had been confined to the house with chronic arthritis. While going downstairs she fell, fracturing the neck of the femur. Six days thereafter, she developed bronchopneumonia, dying 4 days afterwards. General physical examination disclosed an adenomata of the thyroid and generalized arteriosclerosis.

The first objection is illustrated in this example by the fact that some physicians would choose the bronchopneumonia as the primary cause of death because it is the immediate cause of death. Others would select the fall, feeling that this gave rise to the shock and confinement in bed, without which the pneumonia would not have occurred. Some might go so far as to select the chronic arthritis, reasoning that it was the cause of the fall.

The second objection deals with how many causes of death should be noted on the certificate. Some physicians would report only bronchopneumonia or the fall. Most would list both conditions. As contributory causes, some physicians would decide to list none; others might list arteriosclerosis, arthritis, and adenomata of the thyroid. Obviously the intent of the contributory cause notation is to obtain those causes which contribute to the *risk* of dying. Consequently, the adenomata of the thyroid should not be included since it played no part in the death. The chronic arthritis and arteriosclerosis would be included only if, in the physician's opinion, they contributed to the death risk.

The third objection to the present form of the certificate centers in the fact that date of onset is not usually noted. Without these dates, the causal sequence of events leading to death could not be determined by the coding clerk. Frequently the physician does not know the exact dates of onset even though he is fully aware of the causal sequence involved.

The fourth objection arises from inconsistencies in dealing with the morbid condition (in this example, chronic arthritis) which precedes death but could not cause it.

The two important variations in the method of asking for cause of death information on the death certificate are illustrated by the forms now in use

UNITED STATES STANDARD CERTIFICATE OF DEATH
(Example inserted)

The principal cause of death and related causes of importance were as follows:	Date of onset
Fracture neck of femur	10 days
Fall down stairs	10 days
Bronchopneumonia	4 days
Other contributory causes of importance: Chronic arthritis	- - -
Arteriosclerosis	- - -

ENGLAND AND WALES CERTIFICATE OF DEATH
(Example inserted)

I. CAUSE OF DEATH	
Immediate Cause	a. Bronchopneumonia
	due to
Morbid conditions, if any, giving rise to immediate causes (stated in order proceeding backward from immediate cause)	b. Fracture neck femur
	due to
	c. Fall downstairs
II.	
Other morbid conditions (if important) contributing to death but not related to immediate cause	Arteriosclerosis
	Chronic arthritis

in the United States and in England.

Differences exist between countries in their methods of determining the primary cause of death which is to be tabulated. Some countries, like the United States, use a *Manual of Joint Causes of Death,* which describes an arbitrary method for choosing the primary cause of death. After considerable experimentation, the English came to the conclusion that the best solution lies in a system mainly based on the certifying doctor's opinion. Authorities in this country feel that such a plan would distort the comparability of our statistics on death.

Perhaps a compromise plan for the United States would be the addition of a question to the cause of death statement on the death certificate, such as: "To which multiple cause should death be assigned?" The physician's

answer to this question could then be tabulated independently from routine death information based on the primary cause of death as selected by the *Manual of Joint Causes of Death*. By this expedient, the results of the physician's opinion could be obtained without interfering with the comparability of statistics on cause of death.

It is doubtful if comparability in the interpretation of death rates can be achieved, *regardless of the method used in the selection of the primary cause of death,* until more real knowledge is obtained about the contributory causes of death. Tabulations of contributory causes would show the extent to which certain diseases are important factors in causing death even though they might not be selected as primary. For instance, the over-all typhoid rate for a community has as much, if not more, significance to the health department than has the death rate in which typhoid fever is listed as the primary cause. The extent to which each disease is associated with other diseases must be known if the true risks of death are to be equated. Even within a given community, the death rate of certain causes of death can be noncomparable in two successive years, not because of the particular disease in question, but due to its association with some contributory cause of death which varies markedly in the successive year. This was particularly true in the influenza epidemic of 1918 for causes of death which took priority over influenza.

In view of these considerations, and after discussion with authorities in a number of European countries, it has been suggested to nations using the complete *International List* that they tabulate multiple causes of death for a trial year or two. Such a tabulation is planned for the deaths of 1936 in the United States. A number of nations—England, Scotland, Denmark, Switzerland, Canada, Turkey, New Zealand, and Norway—have agreed to produce similar tables. As a consequence, the subject will receive consideration at the International Conference for Revision of the *International List of Causes of Death* in the fall of 1938.

It is likely that ideas concerning mortality will shift considerably when such contributory cause of death tabulations become available. For example, traffic control officers have questioned the fact that accidental deaths are assigned at times as traffic deaths when some other condition, such as pneumonia following the accident, has been the immediate cause of death. The relative unimportance of this criticism is seen in the statistics for Maryland in 1935 which show that 78 per cent of all motor vehicle accidents coded as primary causes had no other contributory cause whatsoever. In the remaining group of motor vehicle accidents, the bulk of the cases, which had contributory conditions, were involved with the following diseases: apoplexy, heart and arterial (50 per cent); pneumonia and respiratory causes of death (27 per cent); septicemia (blood poisoning) (7 per cent); and a miscellaneous group of diseases of one or two cases each (16 per cent). In practically all of these conditions, death would not have resulted if the accident had not initiated the sequence of events leading to death.

CONCLUSION

In the adaptation of the *International List of Causes of Death* to the changing needs of the medical profession and public health groups, the essential goal to be achieved is the production of comparability in mortality statistics.

This cannot result simply by alterations in the *International List*. The major problem also involves the

methods of collecting the data and the stimulation of accuracy in the recorded data. Suggestions are made in this paper by which some of the factors affecting statistical comparability can be evaluated and remedied.

Keeping Well

"The growth of science and the applications of science to practical affairs have no doubt brought, along with their advantages, serious difficulties. There is no ancient wisdom to guide us in the new circumstances. Keeping well has come to be increasingly dependent upon individual and social activities that receive their direction from science: the new conditions have to be studied intensively and systematically by the very methods that have brought them to be. We cannot return to nature. The remedy for the difficulties created by science is to be found in more science.

"The changes brought about by the industrial revolution have another bearing upon health that is becoming ever more obvious. Heretofore ill health or suffering was almost entirely the concern of the individual in distress and of his immediate relatives and friends. As time goes on the illness of individuals comes to be a matter of far-reaching social significance, in the political and economic phases. We know, of course, that a sick individual may become a menace to the health of his neighbors as a source or as a means of infection. Aside from this, however, the increasing complexity of our lives sooner or later makes the individual whose health is not up to standard a burden to others.

"In his industrial relations, the sick or ailing person is unable to carry his share of the total burden of work. He demands more than his share of overhead costs and of supervision. He often slows down the production of others, or adds to the hazards of their work. His incapacities eventually call for retirement and support at an unduly early age. Just as it is of advantage for every individual in the community that his fellow citizens be as intelligent, and well informed, and competent as possible, it is of advantage to every one of us to have everybody as well as possible: a large part of the waste and cost of illness falls upon the community, directly or indirectly. Those who are not themselves decidedly below normal must recognize that they are being unavoidably taxed by the hygienic shortcomings of others."—From a report on "A Museum of Health," by Benjamin C. Gruenberg, Ph.D., for the Committee on American Museum of Hygiene of the American Public Health Association.

A Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass.*

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AN epidemic of 110 cases of lobar pneumonia, which occurred at the State Hospital in Worcester, Mass., during the early months of 1937, offered an unusual opportunity to study the epidemiology of Type I pneumococcus infections.

We shall first present, in brief, the organization of the hospital. We shall then describe the epidemic as it swept through the institution, and indicate the various steps that were taken to check its spread.

DESCRIPTION OF THE HOSPITAL

The State Hospital for mental diseases at Worcester, Mass., has a fairly constant adult population of about 2,400 patients and 600 employees. It is well organized and expertly administered. It consists of two parts: the Main Hospital with some 1,800 patients and 500 employees, and the Summer Street Division with 600 patients and 100 employees. Summer Street Division is essentially an overflow hospital, to which patients are transferred when approaching their period for discharge. It is 3 miles from the Main Hospital, and has its own separate staff, which has little contact with the Main Hospital staff. It receives no new patents, but admits only those patients that are transferred from the Main Hospital.

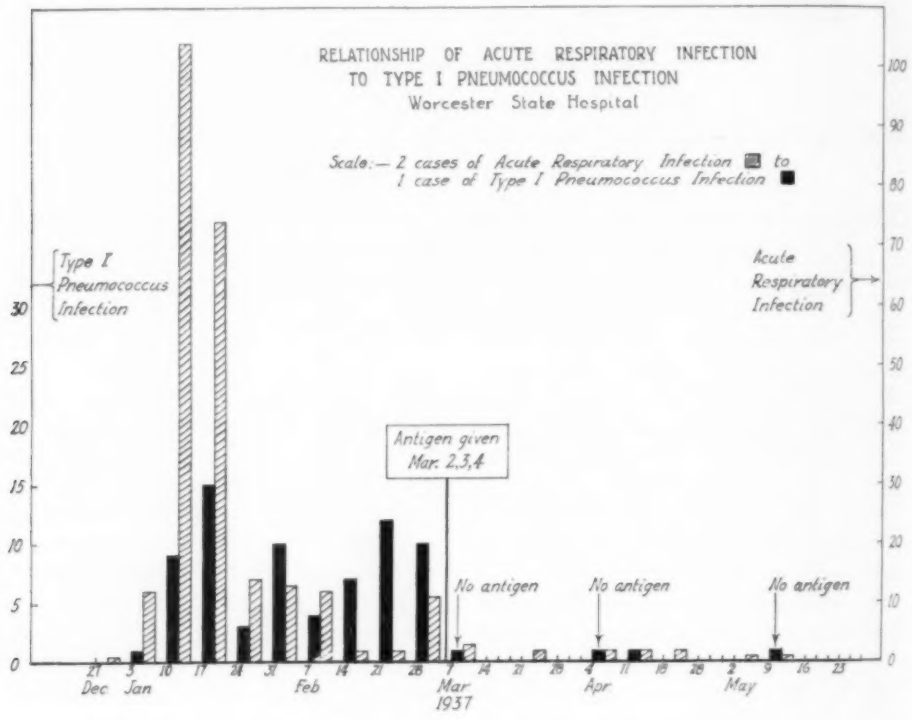
The institution has approximately equal numbers of male and female patients. The male and female patients are segregated in separate wards, and are classified in accordance with their mental condition. Each side of the Main Hospital has an infirmary, one for males, one for females, for the treatment of acutely ill patients. All patients who develop pneumonia or other acute illness on the general wards, and also in Summer Street Division, are transferred immediately to the infirmary for special medical or surgical treatment. All responsibility for the medical and surgical care of the acutely ill patients is centered in one staff physician.†

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

† We wish to express our appreciation of the fine coöperation and aid that was given to us by all members of the hospital staff, and particularly by Dr. F. H. Sleeper, Assistant Superintendent of the Hospital, and by Dr. W. E. Glass, staff physician in charge of acutely ill patients.

CHART I

Chart I shows the relationship of the epidemic of Type I lobar pneumonia at the Worcester State Hospital to the epidemic of influenza. Type I pneumococcus infection prevailed from the very first of January, and increased as influenza increased. The influenza outbreak was over by the middle of February, but Type I pneumonia did not decline until Type I pneumococcus antigen was given on March 2.



Bronchopneumonia has been quite prevalent among the patients of the hospital, as is always the case in institutions for mental diseases. Lobar pneumonia, however, has shown only a slightly higher incidence among the patients and staff of the hospital than in the population of the state at large.

The average annual incidence of pneumonia in the hospital during the past 4 years, including terminal bronchopneumonia, has been as follows: bronchopneumonia, 70.5 cases, 48 deaths; lobar pneumonia, 18.0 cases, 8 deaths.

Pneumonia of both types has been more prevalent in the male than in the female patients of the hospital. The sex ratio of pneumonia incidence in these patients has been about the same as that of the general population.

	Males	*Females*
Proportion of Cases of Bronchopneumonia in the Institution	55%	45%
Proportion of Cases of Lobar Pneumonia in the Institution	64%	36%

As a general rule, bronchopneumonia has prevailed throughout the year, but lobar pneumonia has been much more prevalent during the late winter and early spring months than in the summer and fall.

THE INFLUENZA EPIDEMIC

Beginning early in January, 1937, an epidemic of moderately severe upper respiratory infection invaded the Main Hospital. This outbreak was similar in all respects to an epidemic of acute respiratory infection that prevailed at the same time along the whole North Atlantic Coast. Though many of the cases of this illness, both in and outside the hospital, were relatively mild, nevertheless it seems quite probable that the outbreak was true epidemic influenza.* The course of this influenza outbreak in the Main Hospital is indicated on Chart I.

Summer Street Division, although only 3 miles from the Main Hospital, escaped the influenza outbreak.

The hospital routine was completely upset by the epidemic. It was necessary to set aside certain special isolation wards for care of the acutely sick. The disease spread with rapidity throughout the institution. The peak was reached in the week of January 10, during which 96 cases occurred.

The hospital physicians noted that an unusual number of cases of pneumonia accompanied the influenza outbreak, but at first this fact caused no special concern.

The epidemic of influenza in the Main Hospital followed a characteristic incidence curve, and at the end of 6 weeks, conditions in the hospital had returned almost to normal. However, it soon became apparent that pneumonia was continuing long after the influenza epidemic had terminated. Instead of a concomitant decline in pneumonia with the decline in the incidence of influenza, as had been anticipated, lobar pneumonia continued unabated (see Chart I).

The hospital authorities noted that most of these cases of pneumonia were due to the Type I pneumococcus. They noted also that the onset of the attacks of pneumonia in those cases that occurred in the latter part of February was sudden, without a history of recent acute upper respiratory infection.

THE PNEUMONIA EPIDEMIC

On February 25, we were invited, in our capacity as State Consulting Epidemiologist, to aid in an investigation of the pneumonia situation at the Main Hospital.

A rapid survey revealed the following facts:

1. The epidemic of acute upper respiratory infection (influenza) at the Main Hospital, which began the week of January 3, had terminated, with no invasion of Summer Street Division.
2. Cases of lobar pneumonia were developing at a rapid rate in the Main Hospital. The infirmary was full of them, and new cases were coming in every day.
3. The cases of pneumonia were coming from many different parts of the hospital. The outbreak was not limited to one ward, to one occupational section such as farm hands and outdoor workers, or any single type of patient. Physicians, nurses, and attendants were affected as well as patients.
4. Practically every case of lobar pneumonia was due to the Type I pneumococcus.
5. The pneumonia outbreak was limited to the Main Hospital, and had not invaded the Summer Street Division.
6. There was no unusual prevalence of Type I pneumococcus pneumonia in the city of Worcester, nor in the State of Massachusetts as a whole.

In view of our previous experience with the Type II pneumonia epidemic at Bedford Hospital,[1] we felt quite certain that these findings indicated very strongly that the Type I pneumococcus had become widely distributed and had established itself in all parts of the institution. The source of the infection of the patients was not a single heavily infected individual

*The virus of epidemic influenza was obtained many times in our own and other laboratories by ferret inoculation of material obtained from victims of this epidemic.

(case or carrier) who transmitted the disease through a common vehicle such as food. Carriers must have become highly prevalent throughout the Main Hospital, and these disseminated Type I pneumococci among their fellow patients and the attendants.

A random sample of Type I carrier prevalence in the Main Hospital was made at once. We employed the same technic in detection of carriers that we have used in previous studies.[2] Our surmise was verified almost immediately. The survey indicated that at least 10 per cent of the patients of the Main Hospital harbored the Type I pneumococcus in the nasopharynx. This is a great contrast with a normal population, where Type I pneumococcus is found in the nasopharynx only once[3] or twice in 500 cultures.

The hospital authorities were faced with a serious emergency. They were responsible for a large population of presumably highly susceptible persons who were continuously exposed to a virulent pneumococcus; for it was certain that Type I pneumococcus was widely dispersed throughout the hospital. The month of highest pneumonia prevalence in New England was at hand. New cases of Type I lobar pneumonia were developing every day. The rapid detection and isolation of all the Type I pneumococcus carriers in the Main Hospital was an impossible task, for there were 200 of them at least.

In the face of this situation we determined to make an attempt to check further spread of the epidemic of pneumonia by a rapid immunization of the hospital population.

The antigen * used was a preparation of an antigenically active polysaccharide of the pneumococcus, a compound similar to that described originally by Schiemann and Casper[4] in 1927 and more recently by Avery and Goebel[5] under the name of acetyl polysaccharide. However, the sample had properties more nearly like the polysaccharide studied by Felton[6] in that it was practically devoid of acetyl groups and yet was fully antigenic. The analysis of this antigen, made by Felton, was as follows:

Nitrogen—per cent	3.16%
Glucose number	25.1 %
Acetyl	1.0 %
Precipitin titer	1:2,500,000
Type I immunity in mice	1:50,000,000

In addition, Felton[7] had tested the antigen on human beings and found that a single injection of 2 mg. stimulated antibody production effectively. The obvious advantages of an antigen of this kind are: it is soluble, stable, readily rendered sterile, and easily standardized to insure a satisfactory antigenic dose. We selected the Felton antigen for the above reasons, and also because of the fact that the antigen was immediately available.

The antigen was given subcutaneously in a single dose of 0.5 c.c. (2 mg.) to each adult. Over 1900 patients and attendants in the Main Hospital were injected on March 2, 3, and 4. No ill effects were produced.

The epidemic of pneumonia in the Main Hospital stopped almost immediately following the administration of the antigen. We cannot affirm, of course, that the antigen stopped the outbreak. It is possible that the epidemic might have stopped spontaneously on March 4. The results would have been much more clear-cut if it had been feasible for us to immunize every alternate person, but this was not possible. The hospital authorities felt that if we had any reason to believe that the antigen would give some protection, then we were unjustified in withholding this possible protection from a single patient. A small num-

* This antigen was kindly furnished to us by Dr. Malcolm of the Lederle Laboratories.

ber—about 200—of the patients and a few attendants refused the antigen, and this group served, in some degree, as a control series.

The course of the epidemic is shown graphically in Chart 2. The striking feature is that the pneumonia ceased abruptly following the administration of the antigen. Eighty-four cases of lobar pneumonia had occurred in the Main Hospital between January 3 and March 3. Nine cases of lobar pneumonia occurred after the antigen was given (from March 4 to June 1), only 4 of which were due to the Type I pneumococcus. Three of these had not received the antigen. One patient, I. L., female, 78 years old, who had been given the antigen on March 31 developed lobar pneumonia on April 18 and died in 4 days. This case represents a definite failure of the antigen to protect against Type I pneumococcus invasion. Four of the other patients who developed lobar pneumonia (March 4 to June 1) had been given the antigen, but their pneumonias were due to some other organisms than the Type I pneumococcus.

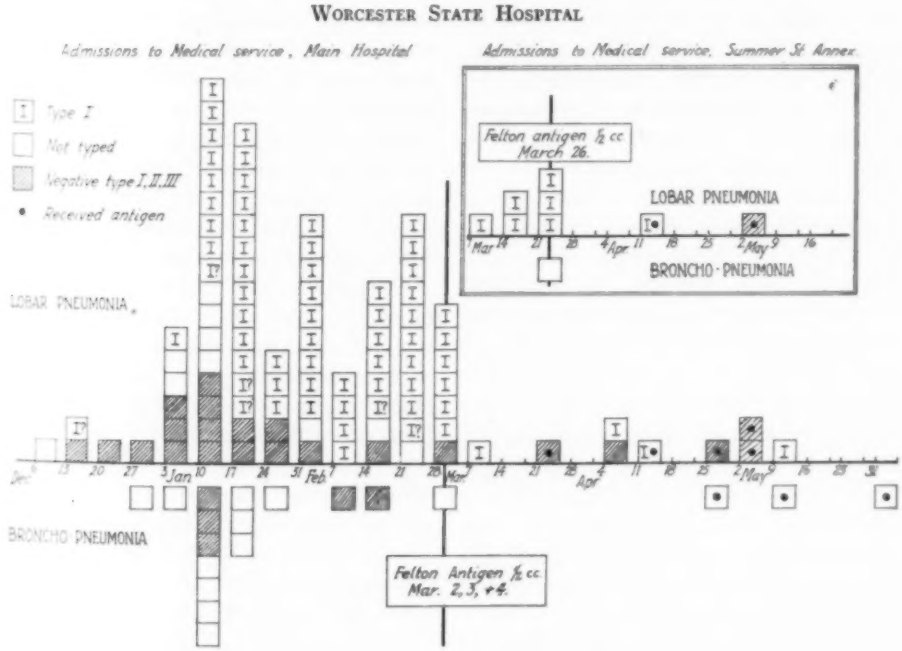
Nine individuals were discovered who had a respiratory tract infection in which Type I pneumococcus was the prevailing organism, yet they never developed typical lobar pneumonia.

CHART 2

Graph of the Course of the Epidemic of Type I Lobar Pneumonia at Worcester State Hospital.

Each square represents a case of pneumonia. Bronchopneumonia cases are shown below the base line—lobar pneumonia above. Each case of proven Type I pneumonia is indicated by a [I] in the square. If the individual had received antigen, it is indicated by a dot within the square.

The small diagram inserted in the upper right hand corner represents the Summer Street Division outbreak which occurred after the Main Hospital epidemic had stopped.



Three of this group were diagnosed clinically as cases of influenza, and 5 as common colds. One had an otitis media, followed by a fatal attack of Type I pneumococcus meningitis.

Case P. D.—Only one in this latter group (P. D.) had been given the antigen on March 3. He came to the infirmary on the evening of March 6 with a temperature of 104° F., pulse 120, and respirations 20 per minute. His leucocyte count was 16,000 per c.mm. and he gave every evidence of a beginning lobar pneumonia. The X-ray report next morning read "questionable early lobar pneumonia." His temperature fell by crisis on March 8. He was quite well on March 9. His sputum on March 7 was positive for Type I pneumococcus. He may be said to have run a complete course of pneumonia in 4 days.

It seems possible that the antigen which was administered 3 days previous to the onset of his illness may have given this patient some degree of protection against Type I pneumococcus invasion.

THE SUMMER STREET DIVISION PNEUMONIA OUTBREAK

The Summer Street Division, 3 miles from the Main Hospital, escaped the epidemic of influenza in January. At the time we began our investigation on February 28, no cases of Type I lobar pneumonia had occurred there.

The first case of Type I lobar pneumonia developed at Summer Street on March 9, nearly a week after the Main Hospital epidemic had ceased. This first patient was a newly appointed attendant, who had had no contacts with the patients of the Main Hospital. In view of these facts we should have been on the alert, and should have made an immediate investigation of Summer Street to determine the prevalence of Type I pneumococcus carriers there, and also to find the source of infection of this first case, but we did not do so.

Beginning on March 19, 5 cases of Type I lobar pneumonia developed in quick succession among the male patients in the Summer Street Division. A fresh supply of antigen was obtained and all the patients and attendants were given a single subcutaneous injection of this antigen on March 26.

The outbreak of pneumonia at Summer Street Division ceased, following the administration of the antigen, just as it had done at the Main Hospital. The course of this outbreak is shown in the insert of Chart 2.

Cases—It will be noted that 2 cases of lobar pneumonia occurred in Summer Street, after the antigen was given. One of these represents a failure of the antigen to protect against Type I pneumococcus invasion. This individual, M. C., 63 years old, was given the antigen on March 26, developed Type I lobar pneumonia on April 17, and died in 4 days. The second pneumonia victim also had the antigen on March 26, but his pneumonia, which developed on May 2, was due to Type IV pneumococcus.

How can one explain the invasion of Summer Street Division by Type I pneumococcus after the epidemic in the Main Hospital had ceased? It seems most probable that the infection was introduced by carriers that were transferred to Summer Street from the infected zone.

Thirty persons had been transferred to Summer Street Division from the Main Hospital between January 1 and April 1. In Table I we have given the dates of transfer of these individuals.

Cultural studies of the nasopharynx of each of the entire group of transfer patients were made on March 29. Two, a woman transferred on March 1 and a man transferred on March 29, were found positive for Type I pneumococcus. The woman could not have been the direct source of the infection of the Summer Street cases of lobar pneumonia, because all the pneumonia cases had come from the male wards. The man was not responsible, because the infection had been introduced be-

TABLE I

Table of Transfer of Patients from the Main Hospital to the Summer Street Division from January 1 to April 1, 1937

Date	*Number of Men*	*Number of Women*	*Remarks*
January—1st week	4	1	No further transfers in January because of influenza epidemic at Main Hospital.
February 1	3	1	
" 17	3	0	
" 19	4	0	One man, J. F., was convalescent from lobar pneumonia, which he had developed Jan. 14. Type I pneumococcus was never found in his sputum
" 24	0	1	
March 1	0	2	One woman, L. W., was found to be Type I carrier on March 29.
" 3	1	0	
" 5	0	1	
" 8	2	0	
1st case of Type I pneumonia developed.			
March 25	4	0	
" 29	3	0	One man, M. D., was found to be a Type I carrier on March 29.

fore he arrived, probably between February 15 and March 1. (See Chart 2). It seems quite possible that patient J. F. (see Table I), who developed lobar pneumonia in the Main Hospital on January 14, and who was transferred to Summer Street on February 19, was the source of infection. We know that the new cases originated in the ward to which he was sent, and the outbreak began shortly after his arrival. The chain of evidence is not complete, however, since the throat culture of J. F. was negative on March 29, the date that the Summer Street carrier studies were first made.

We can be fairly certain that Type I pneumococcus was transferred from the Main Hospital to the male wards of Summer Street Division late in February. The infection spread through the male wards, but not the female wards. Subsequent events showed that both carriers and cases of Type I pneumococcus infection were produced following the introduction of the specific organism.

STUDIES OF TYPE I PNEUMOCOCCUS CARRIERS

When we began our study on February 27, the epidemiological evidence suggested that Type I pneumococcus carriers were widely distributed throughout the Main Hospital. Our first step was to take a random sample of cultures from the nasopharynges of patients and attendants from the various wards. We found almost at once that our surmise was correct.

The search for carriers was continued after the antigen had been given, and after the epidemic of pneumonia had ceased. A total of 280 different persons were tested in order to secure an estimate of the prevalence of Type I pneumococcus carriers in the hospital population. Twenty-two normal individuals were discovered to be harboring virulent Type I pneumococci—a carrier rate of 7.8 per cent—or 35 times the normal carrier rate of the general population. Sixteen of these normal carriers were found in the Main Hospital and 6 in Summer Street, most of them during the first month of the

study. The duration of the carrier state in each person is shown in Chart 3. It will be noted that most of the carriers cleared up spontaneously within a short time. By June 7 all but 5 had become negative.

Case—Only one discovered carrier later developed lobar pneumonia. L. R.—41 years old, male, Summer Street Division—was found to be a nasopharyngeal carrier on March 24. He was given 0.5 c.c. antigen on March 26. Some 650 other patients and attendants at Summer Street were inoculated on the same day. Twenty-four hours later he suddenly developed Type I lobar pneumonia.

It is possible that the antigen may have precipitated the attack of lobar pneumonia in this individual. However, 4 other patients at Summer Street were also known to be carriers, and were injected with antigen at the same time as L. R., but without ill effect.

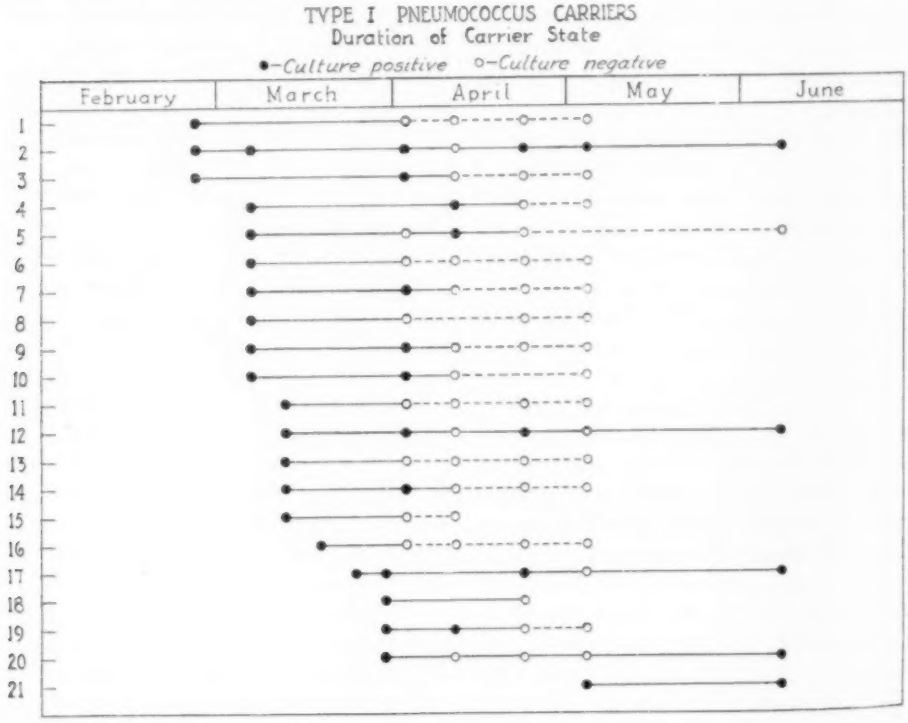
DISCUSSION

The epidemic of lobar pneumonia at the Worcester State Hospital was very extensive and serious in its effects. Between December and May, 110 cases of lobar pneumonia occurred, most of them in January and February.

The fatality rate of the epidemic was high, despite extensive use of Type I anti-pneumococcus serum. Many of the patients were debilitated and noncoöperative. The group in which no pneumococcus type was determined had a particularly high death rate (see Table II). These persons were extremely noncoöperative, and no sputum could be obtained from them. Often the type of infection was not determined

CHART III

The graph illustrates the duration of the carrier state in the 21 Type I pneumonia carriers that were discovered at Worcester State Hospital.



because of the rapid progress and fatal outcome of the disease. It is probable that most of them were infected with Type I pneumococcus.

Sixty-seven pneumonia patients had a positive Type I pneumococcus sputum. It seems probable that most of the remaining 43 cases of the series of lobar pneumonia were also caused by Type I pneumococcus, but this point is difficult of proof. We made an attempt to do so.

TABLE II

Mortality Rates from Lobar Pneumonia in the Epidemic at the State Hospital in Worcester, Mass., 1937

Lobar Pneumonia	*Cases*	*Deaths*	*Mortality Rate*
Type I	73	16	22%
Not Type I, II or III	25	7	28%
Not typed	12	6	50%
Total	110	29	26%

When we began our study, many of the untyped patients were dead. We secured a list of all the convalescent pneumonia patients in whom Type I pneumococcus had not been found, and obtained blood from each of them. They were tested for the presence of Type I specific immune bodies, using standard methods.[8] The bloods of 17 out of a group of 21 that were tested showed a protective power of 100 m.l.d. in standard mouse protection tests. The blood of 6 of these persons agglutinated the Type I pneumococcus in dilution of at least 1–5, and showed a mouse protection test of at least 1,000 m.l.d. We have felt justified in including these 6 persons in the list of those who undoubtedly had Type I pneumococcus pneumonia. They are indicated in Chart 2 as [I ?]. We feel quite sure that all 17 convalescents that showed a blood protection power of 100 m.l.d., and many more of the group of lobar pneumonia patients as well, had also been infected with the Type I pneumococcus, but we have no conclusive proof.

In addition to the actual cases of Type I lobar pneumonia, there were discovered 9 persons who were infected with Type I pneumococcus who never developed typical lobar pneumonia. We can make a fair estimate, therefore, that the total toll of the epidemic was at least 80 to 100 cases of Type I lobar pneumonia, together with at least 9 Type I pneumococcus infections that were not lobar pneumonia.

A cross-section of carrier prevalence indicated that there were at least 200 carriers of Type I pneumococcus in the institution during the epidemic; probably there were many more. As the pneumonia season ended, these carriers cleared up so that it is quite probable that by June 1, not more than 50 carriers remained. Most of these carriers would become negative before the summer was over.

The antigen was given in each hospital division at a time of high pneumonia prevalence. Practically all the carriers were given antigen, but there is no evidence that this procedure affected their carrier state. There is strongly suggestive evidence, however, that the administration of antigen at the Main Hospital checked the further spread of Type I lobar pneumonia in that institution. The disease then spread to Summer Street Division, after it had receded in the Main Hospital. The sudden abatement of lobar pneumonia at the Summer Street Division, following administration of the antigen was striking. The picture here was quite different from that at the Main Hospital. It might be claimed that the pneumonia epidemic at the Main Hospital had run its course when we began our study, and would have stopped on March 4 without any interference on our part.

The same argument cannot be em-

ployed at Summer Street. Conditions were ideal there for the spread of the infection. There were 600 patients and 100 employees. Presumably these persons were as susceptible to pneumonia as had been the group at the Main Hospital. The virulent infection had been introduced recently from the Main Hospital, and carriers became widely established. The cases began to develop rapidly in March, and stopped abruptly following universal administration of antigen.

If a single injection of 0.5 c.c. Type I pneumococcus antigen will protect susceptible individuals from an attack of Type I lobar pneumonia in the face of a heavy exposure and under conditions that are highly favorable for the spread of this infection, then this is a matter of far-reaching significance and worthy of continued study.

CONCLUSIONS

1. An extensive epidemic of lobar pneumonia in 1937 at the State Hospital in Worcester, Mass., which began during an influenza outbreak, was due to the Type I pneumococcus.

2. Type I pneumococcus carriers became widely distributed throughout the Main Hospital. These carriers, and not the actual cases of pneumonia, were responsible for the spread of the infection.

3. The epidemic at the Main Hospital ceased abruptly following administration of Type I soluble antigenic substance (Felton antigen) to the hospital population.

4. A fresh outbreak of Type I lobar pneumonia occurred at Summer Street Division (a branch hospital) 1 week after the epidemic at the Main Hospital abated. This infection entered Summer Street Division through normal carriers of Type I pneumococcus, who were transferred from the Main Hospital to the subsidiary hospital. The administration of antigen at Summer Street was also followed by immediate cessation of this outbreak.

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* Also see previous and subsequent papers in the *Journal of Immunology* and elsewhere upon this subject by Dr. Felton.

Contact

MY last word is this. Every person who contacts the public in any health organization, no matter what it may be, has some effect on public relations. If you have somebody at the telephone desk, or somebody in the reception bureau, whose attitude is gruff or sharp, he can do more harm than the head of the organization can undo. When we turn the public away with an uncivil answer, we create bad public relations. There really ought to be a training course, however brief, in every organization employing a large personnel in the public health field, to teach their staff how to meet the public, what to say to them, and how to say it. Those who can't learn the knack should be placed where they do not deal with their clientele.—*The Health Officer*, January, 1938, page 435.

The Health Department in the Field of Medicine*

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FOR the purpose of this discussion, "the field of medicine" is here defined to include all activities of the scientific staff of the health department who are primarily concerned with the diagnosis, treatment, and prevention of remediable physical conditions.

In considering how dependent curative medicine is on preventive medicine, it is very difficult to determine where one ends and the other begins. It is doubtful if any phase of curative medicine is complete without due regard to prevention, even though it may be only the immunization of contacts against a communicable disease or the necessary advice to ward off complications or sequelae of acute infectious diseases.

There has been a remarkable expansion of public social services during recent years. These developments reflect the growing sense of responsibility of the community for the health and well-being of the individual members of it. The ordinary citizen today is not only to have a better chance of coming into the world in good health, but must be given every opportunity of making the best of his life before he leaves it.

The fruits of this philosophy are seen in the maternity and child welfare services, educational reforms, preventive and curative health services, slum clearances and in programs for improved housing.

Highly organized federal, state, and local health departments exist which are responsible for the control of communicable diseases and for sanitation. The medical profession works no longer as independent individuals in the field of public health, but perforce as team mates with health departments and through such teamwork results may be accomplished which could not be obtained by individual action.

The medical activities of the Maryland State Department of Health are considered below under headings arbitrarily chosen to follow the activities of the several bureaus and divisions of the department.

Field of Communicable Diseases—In Maryland there is a full-time trained medical officer of health in each county. All services rendered from the central office are conducted through the county health units and include diagnostic aid, epidemiological investigations, preventive inoculation programs, laboratory services, and assistance required to protect water, milk and food supplies.

With regard to the control of certain diseases such as tuberculosis, syphilis, gonorrhea, and poliomyelitis, the health department provides not

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only diagnostic and therapeutic services, but assists in hospitalization. The responsibility for hospitalization and other special types of cure is not predominantly under the health department.

(a) *Tuberculosis*—In addition to the general diagnostic activities provided by the health department, mainly in the forms of tuberculosis clinics, the state also makes provision for the hospitalization of cases in the 4 state tuberculosis hospitals. Three of the local health officers conduct clinics; the other clinics are conducted by staff members of the State Tuberculosis Sanatoria. Provision is also made for the epidemiological investigation of all reported cases, follow-up services with bedside nursing care in some instances, the tuberculin testing of selected groups of individuals, and for X-ray examinations, free of charge, for all cases recommended by the clinician or health officer conducting the tuberculosis clinic or having charge of individual cases of tuberculosis. Portable X-ray machines are now provided by the state which make it possible to have such examinations at even the most isolated clinics.

In our tuberculosis work in Maryland, to maintain the cordial coöperation of the family physician, the clinician conducting the tuberculosis clinics refers all reports and recommendations directly to the family physician and not to the patient. The physician depends largely on the Health Department to facilitate early hospitalization of tuberculosis patients and coöperates fully in the epidemiological investigation of cases and is of great service in instructing the families in preventive measures.

(b) *Syphilis*—The Maryland State Department of Health conducts a diagnostic service through its laboratories which perform serologic tests for syphilis, without charge. The Baltimore City Health Department Laboratory also extends this same service to the physicians practising in Baltimore City. At the syphilis clinics, blood specimens are taken from all patients attending, and the health officer also takes blood specimens from private patients who may be referred by private physicians. Darkfield examinations are made at some of the clinics and in the central laboratory when specimens are forwarded either by the health officer or private physicians. Reports are sent directly to the physician in charge of the case and in no instances are reports sent direct to patients. These diagnostic aids are available for all types of syphilis and gonorrhea, and physicians use the service freely.

We are having a favorable response to our request to the hospitals to make the Wassermann test a routine diagnostic procedure for all admissions. We feel that if this request falls short of its complete goal, if we obtain the test on all maternity cases, we will have made considerable advance. In all of our prenatal clinics held throughout the state, the Wassermann test is a routine procedure and all patients giving a positive reaction are urged to take treatment either from their private physicians or at a clinic.

In our present program in Maryland we have 50 clinics, 40 in the counties, and 10 in Baltimore City, conducted by local health officers in some instances or by selected clinicians who are paid for their services by the state and city. The Department of Health provides neoarsphenamine and preparations of bismuth or mercury for treatment in accordance with modern therapeutic methods. These drugs are supplied without distinction as to the patient's ability to pay the physician a full fee or any fee for the service. This method makes it possible for private physicians to provide medical care to

many patients who cannot afford to pay for medical services.

The services of the county health officers and public health nurses are available to follow up lax cases of the private physician when requested to do so. This is an important feature since only by sufficiently sustained treatment can syphilis be rendered non-infectious and in a number of cases clinical cure procured. A few physicians in their regular practice are doing excellent case finding work with their patients. In an epidemiological investigation the important question is, "From whom did the patient acquire the disease and to whom may he or she have transmitted it?" Early syphilis, syphilis in pregnancy, and congenital syphilis offer the best field for epidemiological investigation. In Maryland a complete case history is obtained from all patients attending the clinic, and the local health officer and his staff of nurses begin their epidemiological investigation from that point.

The State Department of Health furnishes consultation service which has made it possible for local health officers, clinicians, and private physicians to have the benefit of expert advice on the diagnosis of syphilis, especially its late manifestations, and to have outlined for them an approved method of treatment.

We have been able, with the assistance of the consultant on venereal disease, to direct particular attention to the early detection and treatment of neurosyphilis and cardiovascular syphilis, the two types which cause the greatest economic loss from incapacity and early death. In all cases giving a positive Wassermann reaction, treatment is given for 9 months before spinal fluid tests are done. By this procedure we find potential cases of general paralysis of the insane and prevent their becoming a total liability in so far as the state is concerned.

The Baltimore City Health Department has a Bureau of Venereal Disease under the supervision of a full-time director. The city conducts clinics and maintains close contact with out-patient departments conducted by the several hospitals in Baltimore City. A complete follow-up service is provided and all activities are conducted in close coöperation with the practising physicians of Baltimore City.

Our general plan of treatment of all syphilitic cases conforms to the standard plan as submitted by Dr. Parran's committee. We are also meeting no small degree of success in the treatment of syphilis in infants, and in Baltimore City there are several clinics just for congenital cases.

(c) *Pneumonia*—A number of health departments have recently embarked upon an extensive pneumonia control program which includes not only greatly extended diagnostic facilities, but in some states the manufacture and distribution of therapeutic sera for the more common types: *viz.*, type I and type II.

In Maryland, laboratory diagnostic assistance has been extended to all physicians and the demand for this service has steadily increased. On the request of the attending physician, the sera available for the treatment of the disease are furnished at cost.

(d) *Preventive Inoculations*—Diphtheria toxoid administration in Maryland is carried out almost entirely by the local health officer and his staff. Pre-Schick testing is not a routine procedure in the state program, but in several counties where special studies have been conducted, the Schick test has been made previous to inoculations with toxoid.

Post-Schicks are done on the great majority of persons who have received diphtheria toxoid. It has been estimated that 75 or 80 per cent of the school children have received diphtheria

toxoid, and the percentage of preschool children receiving diphtheria toxoid has increased each year. Health departments have a definitely fixed legal responsibility in the control of communicable diseases of which preventive inoculations is only one. I believe that when the family physician recognizes his responsibility to inoculate all children under 1 year of age in his clientele, the work of the health department in this field will gradually become less and less.

In several of the counties the toxoid administration has been carried out largely by the practising physicians, the State Department of Health supplying the toxoid in return for which the physician furnishes the local health department with certain statistics pertaining to the number of injections given. Diphtheria antitoxin is furnished free to physicians for use for private as well as for indigent patients.

Antirabic treatment is furnished free of charge to all patients and is given to those living in Baltimore by a physician on the staff of the State Health Department. Indigent patients living in the counties receive treatment at the local health department.

(e) *Services for Crippled Children*—The care of physically handicapped children includes: case finding of poliomyelitis reported by private physicians and health officers, and of other physically handicapped children referred by the school board through its school survey for crippled children, local health officers, social welfare workers, and private physicians; the organization and supervision of clinics conducted by orthopedic surgeons paid on a per diem basis by the State Department of Health.

The orthopedic surgeons examine patients, make recommendation for hospitalization, surgical care in hospitals, and give definite instruction to the physiotherapists for after-care in the home, and reëducation of affected muscles.

In coöperation with the Board of Education handicapped children are provided for in special classes, and with home and bedside teaching, and rehabilitation. The orthopedic surgeon is in full charge of all patients attending his clinic from date of examination to final discharge of the patient.

(f) *Laboratories and Research*—In addition to the laboratory diagnostic activities, the central laboratory of the Maryland State Department of Health and, to a more limited extent, the branch laboratories conduct medical and technical research in fields which are intimately related to the practice of medicine, with particular emphasis on immunology and serology. Professional members of the staff of the laboratories are available for special assignments to assist county health officers in field investigations and consultations with physicians with regard to the diagnosis and prevention of communicable diseases and the protection of public water supplies. In Baltimore, the City Health Department conducts similar laboratory services, and in addition has an active research program at Sydenham Hospital.

(g) *Maternity, Infancy and Child Hygiene*—The field of maternal and infant hygiene includes to an increasing degree the provision of consultant and technical services. The state has for a number of years conducted itinerant maternal and child health services designed to assist local health officers and private physicians in the maintenance of a high standard of maternal and infant care.

A nurse instructor with special knowledge of maternal and child hygiene has been assigned to some of the counties to devote most of her time instructing nurses and midwives in the technic of this phase of work. Three nurses with obstetrical training and experience have

been employed for this service. The obstetrical nurses deliver selected indigent cases and supervise the work of the midwife. The service has been made available upon the request of the physician for assistance at the delivery in patients unable to provide nursing service for themselves. This service has been most favorably received by the local practitioners.

(h) *School Examinations* — Here again the sympathy and support of the general practitioner is most important if it can be obtained. In a number of communities, where the private practitioner, at the request of the county health officer, has conducted the school examinations they have found this to be a more satisfactory arrangement. The examinations include physical examination of the chest, nose and throat, sight, and hearing. Correction of defects found at school examinations is made at one of the local hospitals, and the physician's fee and hospital charges are met by the local community. In school examinations it is impossible to avoid entering into "the field of medicine" for conditions such as scabies, impetigo, ringworm, and pediculosis. In the rural sections these conditions, if not treated by the members of the health departments will go untreated, as the majority occur among groups unable to afford the services of a physician and in many instances unable to purchase the necessary drugs. In Baltimore City in school work, the policy has long been to allow the family physician, if there is one, to have the last word.

Control of communicable diseases in the schools is a health department activity of major importance, and frequent inspections are made by the health officers in connection with other measures in carrying out this function.

(i) *Dental Clinics*—I do not know of any better organized piece of real health work than the dental clinics. They are held in some localities where no dental facilities are available. Dentists are employed on a part-time basis in some localities and on a full-time basis in others. The clinics are free to those unable to pay, but some are on a self supporting basis, fees being raised by Parent-Teacher Associations and clubs to pay part of the dentists' salaries.

(j) *Field of Public Health Nursing* —We conduct a generalized public health nursing program in which primary emphasis is placed on public health educational and promotional activities. The nurses' activities also include services in the schools and certain specialized services including case finding, assistance and follow-up in connection with the operation of syphilis control clinics, prenatal, tuberculosis, and mental hygiene clinics, and other such functions which have a medical or therapeutic aspect as contrasted with the more restricted preventive measures.

(k) *Disaster Relief* — Disasters of almost any nature, either fire, flood, or earthquake, are invariably followed by problems which are entirely medical in nature aside from the physical accidental injuries. In communities where well organized health departments exist, the health department has been the center of activities and has generally been designated as headquarters for not only official organizations participating in relief, but for other national and local organizations who have always availed themselves of the opportunity to be associated with the health department in its relief program. In major disasters the health officer should inform the public as well as the physician where he may be reached by telephone and the location of the central and local distributing points.

(l) *Control of Typhoid Carriers*— In the field of preventive measures, the control of chronic typhoid carriers

presents a difficult problem. In some states, medical, surgical, nursing and institutional care may be provided by the state department of health at the expense of the state. We have been successful in a number of instances in inducing chronic typhoid carriers to undergo operations for the removal of the gall-bladder with a view to possible removal of carrier restrictions. This is usually not urged, especially for the older carriers. In the limited number of cases thus far so treated, the results have been most satisfactory and the surgeons have become keenly interested in this phase of work.

RELATIONS WITH THE STATE MEDICAL SOCIETY

All programs pertaining to the practice of medicine, either curative or preventive, are discussed with the Council of the Medical and Chirurgical Faculty —the State Medical Society—which acts as a Committee on Public Health, and through this committee the voice of the private practitioner is heard and his interest and coöperation are thus maintained.

We have not attempted any program in "the field of medicine" without first a full and frank discussion of the subject with the State and County Medical Societies. We have been fortunate in having our plans endorsed by the profession, and the Medical and Chirurgical Faculty has addressed letters to the physicians of the state calling their attention to subjects deserving their wholehearted attention in curative medicine as well as in preventive.

The coöperative support of physicians in Baltimore was shown when the Baltimore City Medical Society on the recommendation of its own Committee on Public Health and Relations resolved,

> . . . that the best interest of the community would be better subserved by the Baltimore City Medical Society requesting the City Health Department to put on a campaign on diphtheria immunization and that the physicians of the city coöperate with the Health Department to that end.

The physicians in Maryland have given freely of their time in assisting at clinics, conducting examinations, and administering biologics used as preventive measures, and we are constantly reminding the profession that such work as the eradication of diphtheria, the reduction of syphilis, and the adequate care of expectant mothers and young children must rest largely in the hands of the practising physician.

The cordial relations which exist between the state, city, and county health departments and the medical profession has eliminated many of the defects of earlier days. We believe that the results accomplished justify the means and at present, at least, there is no need to defend the efforts of the Maryland State Department of Health in "the field of medicine."

In the midst of our manifold perplexities, the progress we have made should hold encouragement for the future. We can say with Carlyle,

> Doubtless this age is also advancing. Its very unrest, its ceaseless activity, its discontent contains matter of promise. Knowledge, education are opening the eyes of the humblest; are increasing the number of thinking minds without limit. This is as it should be; for not in turning back, not in resisting, but only in resolutely struggling forward, does our life consist.

The Dark Adaptation Test for Vitamin A Deficiency*

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THE dark adaptation test for vitamin A deficiency is based on a common and familiar experience which consists essentially of the observation that in order to "see" in relative darkness the human eye must become accustomed or "adapted" to darkness. The physiological characteristics of this phenomenon, known as dark adaptation, have been extensively studied. Fundamentally the process is a photochemical reaction in which visual purple, the light sensitive pigment in the rods of the retina, is desensitized to dim light by exposure to bright light and is resensitized to dim light through regeneration in darkness.

It is a well established fact that moderately severe vitamin A deficiency is accompanied by an abnormality of the dark adaptation reaction, known as functional night blindness, which is manifested by an inability to see at night or in a dim light. Also, a direct chemical relation between vitamin A and visual purple has been proved. The precise physiological relation between vitamin A, visual purple, and rod function is not yet known; but it has been postulated that the amount of vitamin A in the body may influence dark adaptation. Furthermore, although no satisfactory proof of a functional relationship between vitamin A and dark adaptation has been furnished, it seems not unlikely that mild degrees of vitamin A deficiency might be expected to result in delayed adaptation.

On the basis of these considerations a number of workers, particularly during the past few years, have investigated the measurement of vitamin A status by means of dark adaptation tests.

Using the Birch-Hirschfeld photometer, Jeans and Zentmire,[1, 2] devised a test and applied it in a survey of Iowa school children. As a result of the study these investigators drew the striking conclusion that between 26 and 79 per cent of 404 children examined showed evidence of vitamin A deficiency. I. O. Park[3, 4, 5] reported the test to be satisfactory for studies of adults and children and confirmed the impression of the comparative prevalence of vitamin A deficiency. Jeghers[6, 7] also used the test on adults and found mild to moderate degrees of vitamin A deficiency to be common among many supposedly healthy adults. However, Snelling[8] concluded that the Birch-Hirschfeld photometer was unsatisfactory, both in adults and in

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

children, for measuring small differences in dark adaptation such as might accompany vitamin A deficiency.

A later paper by Jeans, Blanchard, and Zentmire[9] included a description of a new instrument, the biophotometer, and an improved standardized technic for measuring dark adaptation. Reviewing their earlier survey findings in the light of results secured with the new method, these workers essentially confirmed their previous conclusions regarding the prevalence of vitamin A deficiency in children.*

In a very recent report, Palmer and Blumberg[10] presented data, secured by the U. S. Public Health Service and based on a study of the biophotometer technic as a method for detecting mild vitamin A deficiency in the routine survey of school children. The material included the results of biophotometer tests of 585 children in the 3rd to the 8th grade of elementary schools in Maryland and the District of Columbia. In this study it was observed, as mentioned by Jeans, Blanchard, and Zentmire, that considerable improvement in readings, apparently due to a learning factor, resulted from repeated testing of the same children. Also, a great variation was found in successive tests of the same individual. These findings were interpreted as indicating that very little dependence could be placed on results based on a single test of a child. In addition to indicating these disturbing aspects of the test, it was pointed out that considerable uncertainty exists regarding proposed methods for classifying biophotometer measurements as representing different levels of vitamin A nutritional status. As a result, the conclusion was reached that the biophotometer technic does not yet appear to constitute a reliable method for detecting mild degrees of vitamin A deficiency in the routine survey of school children.

FEEDING STUDY

Some further data bearing on the problem of dark adaptation tests and vitamin A are now available from a special study carried out in conjunction with the U. S. Public Health Service surveys in Maryland. The character of this study was dictated primarily by the fact that nearly all of the evidence presented in the literature for considering the dark adaptation test to be an index of vitamin A status is based on improvements in adaptation measurements following the ingestion of the vitamin. However, no adequately controlled experiments have been reported in which changes in the dark adaptation reaction have been studied for comparable groups of individuals, one group being given vitamin A and the other group not being given the vitamin. In view of this the following experiment was undertaken.

Method—From among a group of approximately 450 3rd to 8th grade school children who had been given a biophotometer test in February and March, 1937, 106 were selected for special study. This selection was made on the basis of the results of the biophotometer test, the largest proportion of the children being those whose dark adaptation test marked as "deficient" in vitamin A, according to the criteria of Jeans, Blanchard, and Zentmire, a smaller proportion, those marked as "borderline subnormal," and a few marked as "normal." No children were included who had any evidence of ocular pathology as revealed by ophthalmoscopic examination. The children were separated, by random shuffling of their initial record cards,

* Jeghers[11] recently reported the results of a biophotometer study of 166 medical students, 35 per cent of whom showed photometric evidence of vitamin A deficiency.

into two groups, one to serve as a feeding series and the other as a control series.

As a preliminary to the feeding study, each child was given 3 biophotometer tests in addition to the initial test in order to obtain supplementary data regarding the reliability of the readings. Following this for 5 weeks each child was given a biophotometer test at weekly intervals, during which the children in the feeding group each received an average daily supplement of 18,000 International Units of vitamin A (equivalent to more than 8 teaspoonfuls of U.S.P. cod liver oil), or a total of 630,000 International Units in 5 weeks, in the form of halibut liver oil capsules.* The control series received daily supplements of 0.05 International Units of the vitamin in similar capsules. Parental permission was obtained to give vitamin A supplement to all of the children. It is obvious that the children receiving the supplement of 0.05 units of vitamin A per day constitute the control group. As an assurance that the dietary supplement was actually consumed, the capsules were given to the children at the school and were swallowed under the direct observation of an attendant. It may be stated also that none of the children or parents, and none of the persons actually making the biophotometer tests knew which was the feeding and which was the control series.

Results—The biophotometer test, as described by Jeans, Blanchard and Zentmire,[9] and as employed in this study, consists of a series of visual threshold measurements or readings which are made following a standardized exposure of the subject's eyes to a bright light. The interpretation of the test is assumed to depend on the form and position of the dark adaptation curve derived from the threshold measurements. According to the test procedure which has been proposed, however, it is presumed posible to judge the status of vitamin A nutrition from the values of threshold measurements made at two points on the adaptation curve. The more significant of these measurements is considered by Jeans, Blanchard, and Zentmire[9] to be the reading made at about 25 seconds (20–30 seconds) following exposure to the bright light*; of lesser significance these workers consider the reading made at 10 minutes after dark adaptation begins. In accordance with this practice, therefore, the presentation of results of the study is limited to the data in Table I and Figure I. In the table the means and standard deviations † are given for both groups of children for readings made at 25 seconds and at 10 minutes after dark adaptation begins. The results of the

* The vitamin A potency of the preparation was confirmed by assay, through the courtesy of Dr. E. M. Nelson, Chief, Vitamin Division, Food and Drug Administration, U. S. Department of Agriculture.

* It may be mentioned that a reading taken after only 25 seconds of dark adaptation probably measures the action of the cones of the retina, rather than that of the rods. Much is known of the relation between vitamin A and rod function, but no relation has ever been shown between vitamin A and the retinal cones.

† The threshold measurements used in this analysis are expressed as logarithms of millifoot candles of light intensities. Most workers, however, have used the absolute values of millifoot candles, and the criteria proposed by Jeans, Blanchard, and Zentmire[9] for judging vitamin A deficiency have been expressed in such terms. Sufficient and sound reason, however, dictate the use of the logarithmic scale: First, the scale with which the biophotometer is equipped, and in which the readings are recorded, is a logarithmic scale of millifoot candle values expressed in arbitrary units. Second, the threshold measurements obtained in the dark adaptation test constitute a type of sensory measurement for which logarithmic scales have been proved in the past to be most satisfactory. Third, the practical utility of the logarithmic scale becomes apparent when frequency distributions of biophotometer measurements are made. Such distributions are very markedly skewed on the absolute millifoot candle scale, while they follow very satisfactorily the normal probability distribution on the logarithmic scale. Through the use of the logarithmic scale, therefore, it is possible to make use of those theoretical considerations which have been found applicable to the normal frequency curve.

TABLE I

Means and Standard Deviations (Logarithms, Millifoot Candles) of 25 Second and 10 Minute Biophotometer Readings for an Experimental Group of 54 Children Given Vitamin A Supplement and a Control Group of 52 Children; All Children Given 4 Preliminary Tests Followed by Weekly Tests for 5 Weeks

Time During Adaptation When Reading Was Taken	Group of Children Tested	Preliminary Tests				Subsequent Weekly Tests				
		1st	2nd	3rd	4th	1st	2nd	3rd	4th	5th
		Mean, biophotometer measurements (logarithms, millifoot candles)								
25 seconds (20–30 seconds)	Vitamin A	+0.088	+0.009	−0.030	−0.072	−0.149	−0.194	−0.193	−0.245	−0.284
	Control	+0.025	−0.029	−0.058	−0.080	−0.122	−0.151	−0.151	−0.203	−0.313
10 minutes	Vitamin A	−1.448	−1.601	−1.623	−1.706	−1.822	−1.810	−1.832	−1.791	−1.950
	Control	−1.459	−1.540	−1.544	−1.600	−1.719	−1.669	−1.726	−1.659	−1.885
		Standard deviation, biophotometer measurements (logarithms, millifoot candles)								
25 seconds (20–30 seconds)	Vitamin A	0.204	0.147	0.199	0.175	0.195	0.177	0.184	0.175	0.215
	Control	0.207	0.162	0.174	0.152	0.205	0.172	0.187	0.246	0.205
10 minutes	Vitamin A	0.381	0.313	0.296	0.350	0.333	0.291	0.377	0.432	0.352
	Control	0.367	0.312	0.317	0.367	0.340	0.350	0.400	0.436	0.430

4 preliminary trial tests are given first, followed by the results of the weekly tests given after the supplementary feeding was begun. The data shown in the figure illustrate graphically the changes in the mean values of the threshold measurements for the successive tests. The ranges of the measurements are illustrated by lines representing two standard deviations above and below the mean values.

With regard to the general aspects of the results of the analysis, two striking facts may be noted: (1) it is evident that marked improvement in the averages of the threshold measurements occurs in successive tests in both the children fed the vitamin concentrates and in those not fed; (2) the measurements show a very high degree of variability as indicated by the ranges marked out by two standard deviations above and below the means.

Study of the data for the reading made at 25 seconds shows that the means of the first preliminary test for both the feeding and control groups fall into the range of values which are considered, by the criteria of Jeans and coworkers, to represent vitamin A deficiency. The average for the group that was subsequently given large doses of vitamin A, the feeding group, is a little less than the average for the control group; on the fourth preliminary test, however, the averages for the two groups are almost identical. During the 5 weeks of supplementary vitamin feeding, the averages for both groups for the 25 second reading continue to increase, the averages of the feeding group being slightly higher except for the readings made at the end of the feeding period. None of the differences between the averages for these measurements is however, statistically significant. It may be mentioned, also, that at the end of the experiment 45 per cent of the children in the feeding group gave readings which are not considered normal by present criteria, and a slightly lower percentage of children in the control group gave similiar readings.

The data given for the 10 minute adaptation reading are similar in general to those given for the 25 second reading. The averages for the initial preliminary test for both groups are essentially identical, and for this measurement the averages fall well within the range which by the proposed criteria is considered to represent normal vitamin A intake. On the fourth pre-

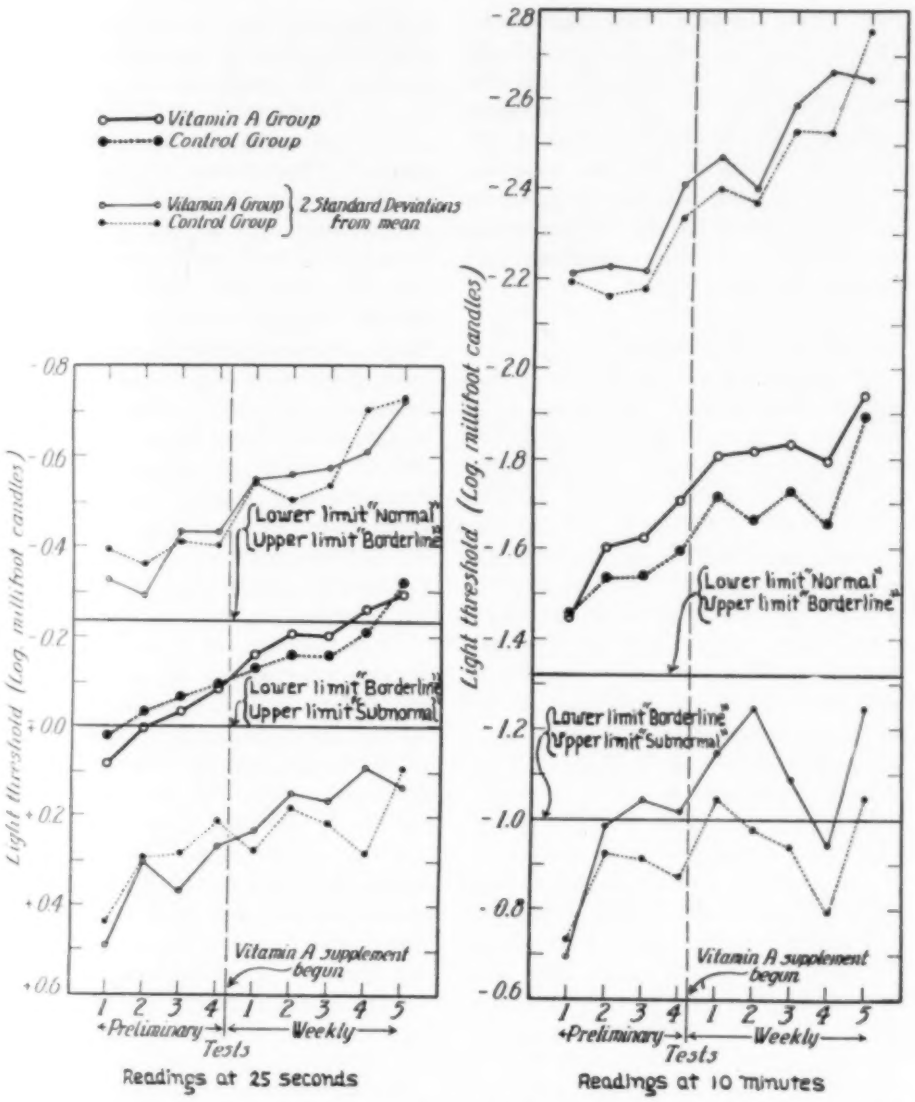

FIGURE I—Changes in means and standard deviations of biophotometer readings made at 25 seconds and at 10 minutes for feeding and control groups of children given 4 preliminary tests, followed by weekly tests for 5 weeks

liminary test the average for this reading for the group of children given large doses of the vitamin is somewhat higher than the average for the control group. The difference between the averages for the feeding and control groups is maintained at approximately the same value thoughout the feeding period except for the measurement made at the end of 5 weeks, at which time the averages for the two groups are again very similar. It is apparent that the measurement made 10 minutes after the beginning of the adaptation period shows great variation, and there seems to be some difference in favor of the feeding group. However, the major part of the difference appears

even before feeding was begun, and the averages of the two groups are essentially alike at the end of the feeding period. As a result of these findings, particularly in view of the enormous variability of the measurements, it is not possible to attribute the improvement in the measurements conclusively to the supplementary vitamin feeding.

DISCUSSION

In attempting to evaluate the meaning of this study, discussion of a number of points would appear indicated. These concern the possibility of fortuitous increase of the vitamin intake in the control group of children studied, the method of selecting the children for study on the basis of levels of deficiency determined by biophotometer tests, the insufficiency of evidence of the actual quantitative relationship between vitamin A and dark adaptation, and the relation of the herein presented findings to those of other workers in the field.

In connection with the first point, it is apparent that no rigorous control of the home dietaries was obtained for the children under study. Accordingly, it is possible that a coincidental increase of vitamin A in the diets of the children in the control group occurred. However, a significant change in the vitamin A content of the home diet in a large percentage of the 52 control subjects at this time —February, March and April—would appear to be unlikely.

With reference to the selection of subjects, it may be said that an attempt was made to select as many as possible of those children whose dark adaptation measurements indicated deficiency according to those criteria which have been proposed in the literature. However, in light of the shortcomings of the biophotometer technic, discussed in a previous publication,[10] it is possible that the interpretation of deficiency may be inadequate, and as a result the possibility exists that few or no children with vitamin A deficiency were actually included in this study. These latter impressions are further supported by the findings of the present investigation that a large proportion (45 per cent) of the children who originally had subnormal or borderline readings failed to give normal adaptation measurements at 25 seconds even after receiving vitamin A concentrates. If such a large proportion of apparently healthy children fail to give "normal" measurements after supplementary feeding, it seems indicated that the proposed standards for the dark adaptation measurements with the biophotometer may be incorrect or too rigorous.

The question of the factual evidence now available for believing that a relationship exists between vitamin A and dark adaptation measurements is of importance in connection with the interpretation and evaluation of the results of this and other studies. In general, evidence for this belief is based on experiments in which dark adaptation measurements are made before and after a period of vitamin supplementation on groups of subjects without negative and comparable control studies. In the case of the feeding group studied here, a procedure was followed in which two groups, one fed and the other not fed the vitamin supplement, were tested. Since the results of this study, where a negative control group is included, are unsatisfactory and inconclusive, it is indicated that conclusions based on studies which do not include provision for controls may be considered questionable.

On the basis of the study here presented and the related discussion, it seems necessary to conclude that the biophotometer technic, in its present

form, cannot yet be considered reliable or satisfactory for detecting mild forms of vitamin A deficiency in children. It is apparent that this conclusion is not in harmony with the impressions of some other investigators. Reasons which form the basis of the differences in views regarding dark adaptation tests and vitamin A deficiency have been given in this and in a previous publication.[10] These reasons appear cogent, but a careful evaluation of all the evidence now available concerning the biophotometer test reveals that conclusive results, either favorable or unfavorable, have not yet been obtained. On the basis of apparently sound theoretical considerations, it seems very probable that it *should* be possible to measure quantitatively the vitamin A nutritional status by means of dark adaptation tests. Equally sound considerations would appear to indicate that a satisfactory and practical methodology has not yet been developed for routine application in surveys of children.

SUMMARY

An investigation is reported in which the effect of vitamin A administration on biophotometer dark adaptation measurements in school children was studied. The results showed no significant difference in the improvement in biophotometer measurements between a group of children whose diet was supplemented and a control group whose diet was not supplemented with vitamin A. The need is indicated for further work on the relationship between dark adaptation and vitamin A and on methods for measuring the relationship, particularly in surveys of children.

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Present Status of Phosphatase Test for Pasteurization*

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HEALTH officials have long dreamed of the development and use of a practical test for pasteurization. Many tests have been tried and found wanting. In fact a test of this kind has long been a sort of mirage always alluringly just out of reach but never quite attainable.

In view of this it will not be surprising to encounter some skepticism, on the part of those who have not had experience in the use of the test, when we say that the millenium has come. A practical means of determining whether or not milk and cream have been properly pasteurized is now available in the so-called phosphatase test.

Examination of our own records of outbreaks of disease traced to raw milk have convinced us that pasteurization of milk is a practical and necessary safeguard to the public health. The opinion of health officials generally on this subject was well expressed by the following statement in a recent editorial on "Pasteurization in England and America" in the *American Journal of Public Health:* "Raw milk, whether in England or America, should no longer be permitted to impede public health progress." Health officials who recommend the use of pasteurized milk should be in a position to assure the public that milk labeled "pasteurized" has actually received sufficient heat treatment to make it safe. The phosphatase test is the first means the health officer has had to determine whether a sample of milk has been adequately heat treated.

The literature has contained reports upon tests for heated milk [1] for the past 30 years or more. Some of the early tests would differentiate milk heated to about 70° C. or above from raw milk. The better known of these is that of Rothenfusser [2] designed to measure the effect of heat on the enzyme peroxidase. Modifications of this test [3, 4, 5] based upon the effect of pasteurization on the enzyme diastase have been tried unsuccessfully as tests for pasteurization. Other tests for heated milk including the microscopic cellular test,[6, 7] have failed to differentiate between pasteurized milk and milk undertreated in pasteurization. Some of these tests including the more recent amylase test as modified by Gould [4] and by Leahy [5] would differentiate, in our experience, between unheated milk and properly pasteurized milk but fail to show consistently dangerous degrees of undertreatment. Furthermore, on occasions our laboratory found amylase absent in samples of raw milk.

It seemed almost incredible that an enzyme could be found in milk that would lend itself to the purposes of a

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test for pasteurization, that is, would be always present in raw milk in abundance and would be almost completely devitalized by the heat treatment required for the pasteurization of milk. Phosphatase is such an enzyme.

The test was developed by Kay and Graham.[8] Reports from England indicating its successful use led us to try it out. In our work we have used a modification by F. W. Gilcreas[9] in which color comparisons are made in test tubes instead of by tintometer. The technic has been reported elsewhere[9] but a brief statement of the principle involved is in order. The test is based upon the action of the enzyme phosphatase which is present in raw milk but is almost completely devitalized by pasteurization, on a buffer substrate containing disodium phenol phosphate, Folins reagent being also added. During incubation for from 18 to 24 hours at 37° C., phenol is liberated in proportion to the amount of phosphatase present which after clarification of the sample is read by comparing the intensity of the blue color in test tubes with that produced by known concentrations of phenol or with permanent standards. Controls are used.

Preliminary tests with this technic on prepared samples unknown to the examiner indicated that the test will show as undertreated (a) milk held at 143° F. for 25 minutes, (b) milk held for 30 minutes at 141½° F. and (c) pasteurized milk to which as little as 0.1 of 1 per cent of raw milk had been added. Of course the test will not tell which of these three things has happened.

The New York City Department of Health has developed and used two other modifications of the test, one a quick test for field use, and the other a modification in which the samples are incubated for only 1 hour instead of from 18 to 24 hours and in which Gibbes reagent has been substituted for Folins reagent in the determination of phenol content. Considerable comparative work is necessary before we can say whether one modification is superior to the other.

Our experience in the practical use of the test as well as that of other health departments has been favorable, indicating that the test has great possibilities. A critical trial of the test through the examination of split samples by a group of coöperating laboratories throughout the country is being undertaken under the direction of the Association of Official Agricultural Chemists with a view to having it adopted as a standard method of milk analysis.

In New York State we have examined since 1935 more than 2,000 samples of pasteurized milk and cream. Notwithstanding our previous work in the inspection of pasteurizing plants and in the examination by standard plate count and coliform test of process samples collected at such plants, we found that 8 per cent of samples examined by the phosphatase test were actually raw, and another 21 per cent of samples indicated undertreatment or the addition of raw milk to pasteurized. A total of 632, or about 29 per cent, of the samples were unsatisfactory. In every instance follow-up inspections at the plant resulted in either (a) the operator admitting what had happened to cause undertreatment, (b) our inspector otherwise securing evidence of what was wrong, or (c) in a few difficult cases in our demonstrating that samples processed in what was claimed to be the usual manner but in the presence of our inspector gave properly pasteurized reactions when examined by the phosphatase test.

A review of some typical examples of violations that were found should be of interest.

In one instance the operator was not convinced of the necessity for pas-

teurization and admitted that he bottled raw milk and labeled it pasteurized.

In another instance the dealer sold raw milk to a plant and bought bottled pasteurized milk which the test showed was properly pasteurized. However, a sample of his pasteurized cream gave a raw reaction. He admitted separating some raw milk from his own herd because he only needed a small amount and this was a cheap way of getting cream which he thought had better viscosity than the pasteurized cream he could purchase.

At another plant, the recording thermometer registered 1½° F. higher than the indicating thermometer, resulting in underheating the milk by that amount although it had checked correctly at the time of the last previous inspection.

Still another investigation showed that the recording thermometer clock ran fast, showing 30 minutes holding when actually only 25 minutes had elapsed.

At one plant our investigator found a 24 hour chart was incorrectly used on a recorder built to use 12 hour charts resulting in 15 minutes holding when 30 minutes was shown on the chart.

A potentially dangerous situation resulted when a boiler flue burned out and after unsuccessfully trying to have it repaired in time for the next day's run the dealer took a chance on selling the raw milk. We chanced to collect a routine sample of the milk and detected this by the phosphatase test. He claimed it was the first time this had happened in his 13 years in business.

In following up another unsatisfactory result our investigator found that the operator had forgotten to close the outlet valve before filling the pasteurizer, permitting unpasteurized milk to fill the outlet line as far as the milk pump.

Still another investigation showed that a leak protected outlet valve of the older type was left in a closed position in which the mating grooves were not mated, permitting underpasteurized milk to enter the outlet line.

In a number of instances operators pushed charts by hand from 5 to 15 minutes, thus cutting the holding period at pasteurizing temperature that much to save time.

In several instances raw milk was added to 40 per cent pasteurized cream to make 20 per cent cream.

Another investigation showed that properly pasteurized milk for sale in bulk was placed in a can from which raw milk had been dumped without subsequent washing and sterilization.

One of the more difficult investigations showed that properly pasteurized milk remaining in the pipe lines and bottler when bottling was finished was drawn off in a can that had contained raw milk but had not been subsequently washed and sterilized and was thence dumped into the separator. The cream made from this milk gave an undertreated reaction.

In a large cream plant an interconnection existed in the complicated milk piping to permit raw cream to be cooled over the same surface cooler used for pasteurized cream of which a number of samples gave an underpasteurized test.

One thrifty but poorly informed plant operator caught the drippage of underpasteurized milk from a leak protector outlet valve in a can cover and emptied it into the batch of properly pasteurized milk.

Our investigators found that the undertreated reaction on pasteurized milk at one plant was due to failure to operate the agitator in the small pasteurizer during holding. Milk near the outlet valve was found to be about 5° below pasteurizing temperature. The operator said that he did not use the agitator during holding because when

he started it the temperature dropped on the recording thermometer chart.

Last and perhaps most interesting, the phosphatase test gave a raw reaction on a sample of milk from a 40 quart can at one of two children's camps in which simultaneous outbreaks of gastroenteritis occurred last summer. An investigation at the pasteurizing plant furnishing milk to both camps showed that cans of unlabeled raw milk were stored in ice water in the same vat with unlabeled cans of pasteurized milk. It was evident that a can of raw milk had been either accidentally or wilfully delivered to each of the camps in place of pasteurized milk.

The phosphatase test also has been used extensively during the past year by our two greatest cities—New York and Chicago. The Department of Health of New York City reports having made in excess of 10,000 tests. Similarly the Health Department of the City of Chicago reports having made thousands of tests by the unmodified Kay and Graham technic. Both departments have found enough undertreated reactions to convince them of the value of the test.

Reports also show that the test has been used during the past year by the City Health Departments in Jacksonville, Fla., and Utica, N. Y., and by the Westchester, Cattaraugus, and Tompkins County Health Departments in New York State. Undoubtedly other health departments not heard from also are using the test.

It is not reasonable to assume that conditions in pasteurizing plants in New York State or in New York City or Chicago are much different from those in plants in other sections of the country. Those conditions might have been more serious if it were not for the facts that (a) all raw milk is not infected, and (b) pasteurization provides many factors of safety in both temperature and holding time.

Experience in the practical use of the phosphatase test for pasteurization convinces us that it has great practical value. Although continued use may reveal interfering substances, no serious interference has been encountered to date. Those health officials who recognize the importance of pasteurization of milk to public health and their responsibility to the public to see that milk and cream so labeled are actually pasteurized will welcome this test.

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DISCUSSION

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UNDER the personal direction of Dr. Herman N. Bundesen, the Chicago Board of Health has been interested for a number of years in developing a suitable test or tests for determining the efficiency of pasteurization. Working independently, and also in an attempt to evaluate the practical value of various tests contained in the literature from time to time, it was found that the so-called "enzyme" tests had the greatest possibilities for this purpose.

Our early work done in connection with the phosphatase test followed the suggestion of the New York State Department of Health that by this method it was possible to determine quite small irregularities in the pasteurization process.

It was found early in our experimental work with the phosphatase test, that it indicated that a much greater amount of milk and cream was improperly pasteurized than we believed was actually occurring. True, in many of the first cases found, it was possible to discover and correct defects in plant practice when the phosphatase test indicated improper pasteurization. In some of the instances, however, in which the test indicated improper pasteurization, it was very difficult if not impossible to find the unsatisfactory conditions. It was essential, therefore, that sufficient work be done in the field to establish definitely the correlation between test and actuality.

If the phosphatase test was to be an important part of our milk control program, we must have the assurance that when samples were found bad, there was a corresponding error in operation somewhere that must be corrected.

It was early established that the use of the phosphatase test, as originally detailed by Kay and Graham in their "B" test, gave satisfactory results in the laboratory. This test was operated purposely without modification, an 8 hour incubation period being used to correspond to our required pasteurizing temperature of 144° F.

Routine tests were made by this method of the thousands of samples of milk, and of cream and other milk products collected for chemical and bacteriological analysis in the City of Chicago from every plant under our supervision.

For months painstaking work in the field was done to determine what factors, if any, may affect the accuracy of the test. Without detailing this work, the following conclusion summarizes our results: Pasteurized milk handled in accordance with our requirements will have a blue color lighter than 2.3 lovibond units when subjected to the phosphatase test as described by Kay and Graham (*Journal Dairy Research*, May, 1935).

A color intensity of 2.3 lovibond units or more definitely indicates that:

1. The milk has been insufficiently heated;
2. The milk has been insufficiently held; or
3. Raw milk has been added to the pasteurized milk during the holding period or thereafter.

The number of units above 2.3 indicate approximately the seriousness of the violation.

The test may be applied to milk, skim milk, soft curd milk, vitamin D milk, homogenized milk, goat milk, cream, and ice cream mix. It is not wholly satisfactory for chocolate or cocoa milk and beverages, and for ice

cream to which certain colors and flavors have been added.

The reason so much time was spent by the Board of Health in determining the actual efficiency of the test was the fact that a considerable number of samples of milk and milk products were at first found to be improperly pasteurized, the cause for which we were at a loss to understand. This difficulty was due mainly to our reluctance to believe that so many milk plant employees would rather pasteurize fraudulently than do the work properly. It was soon established, however, that the greatest number of cases of fraudulent pasteurization was due to the faking of the pasteurizer chart by the employee operating the pasteurizing equipment.

The reason it was so difficult on our part to determine fraudulent "pulling" of charts was, first, that the use of air space heaters on all milk pasteurizer vats has made it possible for the plant operators to make a straight line on the chart during the holding period. Previous to the use of these heaters the line would normally vary noticeably throughout the holding period so as to make it easily possible to detect a fraudulent chart. Secondly, during most months of the year the raw milk before pasteurization is lower than the 30,000 bacterial standard for pasteurized milk, so that an excessively high plate count did not always result.

When asked why charts had been tampered with, the pasteurizer operator replied with such reasons as, "I wanted to hurry to get through." "I had too much work to do." "I wanted to quit early because of a holiday or Sunday." It is interesting to note that more than 80 per cent of the illegal samples were found to have been pasteurized on a Sunday or a holiday.

In order to overcome this tendency on the part of operators to make fraudulent pasteurizer charts, it was required that every recording thermometer in the pasteurizing plants under our supervision be modified so that the center hub of the instrument would have attached to it two or more pins to which the chart may be fastened. Should a chart be fraudulently moved, once it has been set on an instrument so equipped, there would either be a tear in the chart at the pins, or a duplicate set of perforations would be made which could be easily detected. This improvement, which was readily provided by all the instrument manufacturers at our request, has proved to be very satisfactory.

Another trick that a dishonest operator may resort to is to open the pasteurizer valve before the end of the 30 minute holding period. We are working at present with the recording instrument manufacturers with a view to installing additional pens or other devices on the recording thermometer which will record the closing and opening of the inlet and outlet valves of the vat or pocket pasteurizer.

In addition to the fraudulent pasteurization described, it was found in other instances that milk was improperly pasteurized although the operator did not know such a condition existed. Some of the reasons found in these instances were:

1. The outlet valve of the pasteurizer vat was not fully closed before the inlet was opened.
2. The raw milk inlet valve to the vat was not fully closed or was leaking.
3. The pasteurizer outlet valve was not fully closed.
4. The use of the same equipment and containers for pasteurized milk as for raw milk without thorough cleaning and sterilization between usages.
5. When small batches are pasteurized in a large pasteurizer, at times the indicating and recording thermometer bulbs do not reach the liquid and so record air temperatures. When air-space heating equipment is used the result is that considerably higher temperatures are recorded than the product actually reaches.

Automatic equipment has been found singularly free from pasteurization defects. Perhaps this is due to a great extent to the fact that all automatic heaters are equipped with pump stop control devices, which we have found to be singularly free from mechanical operating difficulties. Only two instances were found of improperly pasteurized milk in such equipment, and the cause of both of these errors was also readily discerned from an examination of the recording thermometer charts.

We are at present conducting a series of experiments in the application of the phosphatase test to butter and to cheeses of various types. Inasmuch as age and degree of refrigeration seem to affect the results of the test in connection with these products, no definite conclusions are possible at present. The value of a satisfactory test of this nature when applied to these products should prove of inestimable value to the health officer.

In conclusion, it may be said that the upper limit of the phosphatase test has been set low enough so that the enforcement official may be sure there is need of correction whenever that limit has been reached or exceeded.

The application of the phosphatase test will not do away with the necessity for pasteurization plant inspection. Effective inspection work must be continued just as before if we are to be assured of proper plant operation at all times. The phosphatase test should be looked upon as an additional weapon in the hands of the health officer in his work of milk sanitation enforcement.

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WE, in New York City, have long hoped for a positive test to determine the occurrence of improper pasteurization of milk and cream. Three years ago our department experimented with the amylase test which we then applied in special investigations. This test, which was highly recommended at that time, gave promising results.

In August, 1935, about 6 months after we had begun work with the amylase test, we found the reference to the Kay and Graham phosphatase test in the reports of the British Ministry of Health. However, we encountered difficulties in obtaining the required chemicals for the phosphatase test, and since the first results with the amylase test showed promise, we put aside investigation of the British test.

When the series of comparative tests which were undertaken in coöperation with the State Department of Health to determine the value of the amylase test proved that there were some difficulties with this test, we at once proceeded to make a thorough investigation of the Kay and Graham phosphatase test on a large scale. Several modifications of the standard British tests were tried by our laboratory to simplify the procedure and shorten the time for obtaining the result. As a consequence of this study, we found it advisable to replace the veronal buffer used by Kay and Graham with a borate sodium hydroxide buffer and to purify the substrate diphenolsodium-phosphate so as to remove the residual phenol. Through the substitution of a more sensitive phenol detecting agent, namely, 2.6 dibromoquinonchloromide (a reagent similar to the one used in the Gibbs test for phenol in water), we were enabled to reduce the time to a 1 hour incubation period and still retain an accuracy comparable to that of the Kay and Graham technic requiring a 24 hours incubation.

A further modification permitted the use of this procedure as a quick field test by the inspectors, requiring less than 20 minutes.

The accuracy of the laboratory method with the 1 hour incubation is such that we can detect a drop of 1°F. in temperature, a shortening of the holding time of 5 minutes, or the addition of 1/5 to 1/2 per cent of raw milk through leakage or through any other defect. The field test will detect a drop of 2° in temperature, a reduction of holding time of 10 minutes, or the addition of 1 per cent of raw milk.

Since the substrate has a tendency to decompose on standing or ageing, we have developed tablets for both the necessary solutions, namely, the buffer substrate and the buffer reagent. This makes it possible for an inspector in the country to be supplied with material from which he can make fresh stable solutions.

Our field test, we believe, is a significant innovation, as improperly pasteurized products may be detected at the plant or railroad yards by our inspectors, who can thereby prevent the marketing and consumption of such products.

The field test has also a psychological and educational value. The plant employee or the plant operator, having seen that the inspector can detect the presence of improperly pasteurized milk, will be more careful that the products are fully pasteurized. It is also more convincing to see the results of a test run at the milk plant than merely to receive a verbal or written notice to the effect that pasteurization operations were not correctly performed.

All samples delivered to our laboratories for chemical or bacteriological analysis are also being tested routinely for pasteurization. Whenever our laboratory tests show irregularity involving a country pasteurizing plant, the plant operator and our district inspector are notified of the findings. Our city inspectors are immediately assigned to meet the truck or train bringing the product into New York City that day. The field test is performed for pasteurization, and samples are submitted for laboratory test. An abnormal reaction on the field test results in the embargo of the product, which is released only for manufacturing purposes and after repasteurization. At times we find it necessary to exclude plants immediately as a source of milk supply and cream supply for New York City on the basis of our phosphatase test findings. Such plants are kept out until there is sufficient proof that the irregularity has been corrected.

The procedure is similar when city pasteurizing plants are involved, except that our inspectors can be dispatched to the plant within a short time to test the product stored there, and to check the pasteurizing operation.

During the period from April 1 to September 20, 1937, our department examined by this test, 10,635 routine milk and cream samples brought into the laboratories for chemical and bacteriological analyses. Five hundred and fourteen or 4.7 per cent, showed evidence of irregularity in pasteurization to a lesser or greater degree.

During this period we also examined 1,081 samples of milk and cream which were collected from suspicious sources, and of products indicated by our routine tests to be improperly pasteurized. Two hundred and fifty-seven, or 23.77 per cent, of these samples which were collected specifically for pasteurization test were found to be not fully pasteurized.

In addition, our inspectors also applied the field test to about 2,000 samples of milk and cream, finding 219 to be improperly pasteurized.

Some of the more common defects disclosed at the pasteurization plants

as the result of our phosphatase test findings, were as follows:

1. Standardization of fully pasteurized cream with raw or improperly pasteurized skim or whole milk was taking place. In some cases the practice was to standardize the pasteurized cream in the can by scooping out a few quarts of cream from the can and replacing it with skim milk, or milk which was raw, such as certified milk dumped from bottles returned by routes.

2. Recording thermometers were incorrect and registered too high a temperature. In one instance we found the bulb of the recording thermometer resting on the bottom metal portion of the tank, causing the registration of a 4° higher temperature than the actual temperature of the product in the pasteurizing tank.

3. Leaks from the outlet valves of the pasteurizer occurred during the filling and holding period, permitting the seepage of raw or partly pasteurized product into the outlet pipe.

4. Excessive foam was found on the surface of the product in the pasteurizer, held at a temperature less than 143° F. in the pasteurizing process.

5. Agitators were not used during the holding period, causing in some types of equipment, a portion of the milk to be below 143° F.

6. Pasteurized product was run over coolers and over equipment previously used for raw product, without adequate washing and sterilization after such use.

7. Holding of product in the pasteurizing process at 143° F. took place for a period less than 30 minutes. Frequently, this irregularity could not be determined from the recording thermometer due to the time element involved in filling and emptying the tank.

8. Inexperienced pasteurizing operators were substituted during illness, or for other absence of the regular operator. Such operators frequently do not turn the inlet or outlet valve in a correct position to close the inlet and outlet of the pasteurizer fully during the holding period, with the result that some raw product enters the holder, or some not fully pasteurized product enters the outlet pipe of the holder.

In one instance where a continuous long-flow pasteurizer was in use, we found that the electrical pump which was to force the milk through the pasteurizer at a definite rate had been substituted by a steam pump. The rate of flow was irregular and apparently above the permitted capacity of the pasteurizer.

As the result of these findings, we are emphasizing the following requirements:

a. That cream be standardized before pasteurization.

b. That the operator check the recording thermometer daily and that the result of such check be indicated, in ink, on the recording thermometer chart, with the signature of the employee making the thermometer observation.

c. That inlet and outlet valves be examined as to possible leakage.

d. That efforts be made to reduce the foam on the surface of the product during pasteurization.

e. That agitators in pasteurizing holders, which are not properly insulated, should be used during the holding period.

f. That separate equipment be provided for the handling of the raw products, and for the handling of pasteurized products.

We feel that to eliminate the possible irregularity due to the inexperienced or careless operator, it would be desirable to require that all pasteurizing equipment be automatically controlled as to temperature and holding time.

I believe that the phosphatase test represents one of the greatest developments in milk control since the inception of pasteurization. It is amazing that one can as the result of this test determine in New York City that the pasteurizing equipment is not functioning properly at a country plant 200 or 300 miles away, or that the employee in charge of the pasteurization has hurried the operation, or otherwise failed to pasteurize the milk or cream properly. A forecast of the great significance of the phosphatase test was made by Governor Herbert H. Lehman before the American Public Health Association convention on October 5 last, when he stated that it "bids fair to revolutionize milk control policies throughout the United States."

Nutritional Influence on Teeth*

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THE title is not intended to convey the idea that tooth conditions are affected very specifically by the intake of certain foods entirely independently of others which are required by the body generally. Recent research is fast reverting to the original concept that the complex organism is a unit entity. Dental health is no less a resultant of those conditions which make for the health and life of the body as a whole than it is itself one of these factors.[1]

Only the balanced diet (including proper supply of oxygen) will meet the food requirements for absolute health —be it tooth health, ear health, eye health, the health of any other organ or group of organs, or the general health of an individual. Since life begins *in utero,* the foundations of normal well-being depend upon the supply of the essential materials made available through the mother—the health of the latter not being of lesser importance.[2] Furthermore, the balanced diet should be viewed as part of a complete medico-dental clinical and laboratory examination. It should be interpreted as a variable depending upon: (1) age, (2) sex, (3) body build (especially weight and height), (4) occupation, (5) climate (season, immediate atmospheric environment), (6) physiological state; i.e. (a) extent of freedom from physical and mental fatigue based on the hours of rest essential to take one through the daily tasks without the feeling of being tired; (b) extent of freedom from disease, be this due to metabolic malfunction, *per se,* parasitic invasion, or poisoning by toxins of varied nature other than those arising from infection.

These factors determine both qualitatively and quantitatively the make-up of any dietary and, broadly considered, diet regulation is only part of a comprehensive scheme to bring about scrupulous individual hygiene and in turn controlled community hygiene.

A balanced diet may be defined as one which supplies the body at the *required rate* with the proper quantity of substances necessary to build and repair tissues and create heat and energy. The substances may be classified conveniently as (1) proteins including all essential amino acids, (2) lipids including all essential fatty acids, (3) carbohydrates, (4) minerals, (5) vitamins, (6) water, and (7) roughage. Indeed the correct quantity of each food class does not necessarily mean the correct quantity of the essential nutrients. It is extremely important to safeguard the several innate qualities which any foodstuff represents:

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

1. At the source of production—Thus, milk from healthy cows grazing in good pasture is richer than that from cows fed on dry, carelessly mixed feed; also, vegetables from different soils differ markedly, as for example, those from soils watered by sea water will contain iodine whereas those from soils in fresh water regions are practically devoid of this essential element.

2. By correct preservation before reaching the consumer—The responsibility of obtaining only carefully preserved products, in good part, falls upon the consumer. Precaution in purchasing new brands will help a great deal toward freeing the market of poor varieties.

3. By preservation by the consumer.

4. By proper preparation—The chief error in this regard is marked overcooking, frequently in uncovered containers and with a large quantity of water which is usually discarded. Such methods deplete the foods of the very properties for which they have been selected—vitamins lose their effective characteristics entirely, or at least to a large extent, due to excessive heat and oxidation; the minerals dissolve when excess water is used, and if poured off as waste leave the particular foodstuff less valuable as a nutrient source. The end result is inferior food with inevitable poor nutrition and ill health either of the organism as a whole or of one or more of its organs. This leads to increased expenditure for upholding health standards.

Food value is not always proportionate to price. Thus, the high cost purified foods should really be regarded as delicacies and for low income groups must be omitted entirely. Witness also, the favoritism for white-shell eggs as compared with the much less expensive brown-shell ones; or, pure white tightly packed lettuce instead of beet tops.

Variety is frequently stressed as a rule of thumb for obtaining a correct dietary. There is no doubt that greater adequacy may be secured, and if guided by accepted standard requirements daily menus can be arranged which would apparently be commensurate with the needs for normal metabolic activity; yet recent investigation finds that even good combinations may be unbalanced.

Researches on the quantitative salivary analysis of individuals suffering from caries or erosion indicate characteristically different chemical pictures of saliva for different dental conditions.[5] Chart I summarizes some recent data. The analytical figures have been tabulated to show average values, incidence above the average normal range, and odds against random occurrence of deviations from the normal. Thus for erosion, the average hydrogen ion concentration, calcium, magnesium, inorganic phosphate, protein, lipid phosphorus (otherwise called alcohol-ether soluble phosphorus and lecithin) or cholesterol lies entirely beyond that for the same constituent in saliva of normal individuals. Compare the values 6.83, 7.6, 0.75, 18.0, 446, 0.52, 11.2 respectively with 7.14, 6.3, 0.46, 15.2, 298, 0.13, 7.5. The standard deviations are relatively small. None of the average ranges overlap, hence variations from the normal are probably significant. There are apparently two types of erosion, each with a specific salivary composition. One with alkaline saliva yields markedly lower concentrations: hydrogen ion, calcium, magnesium, and protein approach the normal; inorganic phosphate and cholesterol fall below, lipid phosphorus above. The other presents an acid saliva with much higher levels—6.73, 8.2, 0.84, 19.7, 489, 0.60, 12.9 for the analyses in the order listed instead of 6.83, 7.6, 0.75, 18.0, 446, 0.52, 11.2 respectively.

If instead of averages, the distribution with respect to the average normal range be considered, there appears a very high incidence of cases above the high normal level. It is noteworthy that for each analysis, the concentration exceeded the high normal figure in more than 50 per cent of salivas from subjects suffering with erosion. Again, the figures are accentuated for the acid subgroup. Compare 87, 87, 60, 80, 86, 65 with 74, 68, 53, 68, 78, 57 respectively for the percentage of cases yielding salivary calcium, mag-

CHART I

Analyses of Total Unstimulated Saliva[5]

Summary of Results Obtained by Three Common Statistical Methods for Evaluating Probable Significance of Figures

Analyses	Erosion*									Caries†								
	Average Range Not Overlapping Normal			Distribution More than 50% Above Average Normal Range			Odds Against Random Deviations Based on D/P.E.[6]			Average Range Not Overlapping Normal			Distribution More than 50% Above Average Normal Range			Odds Against Random Deviations Based on D/P.E.[6]		
	Total	Alk.	Acid	Total	Alk.	Acid	Total	Alk.	Acid	Total	Alk.	Acid	Total	Alk.	Acid	Total	Alk.	Acid
H. pH	6.83 ±0.05	7.19 ±0.07	6.73 ±0.04	89	..	..	1341	1.0	15x10[5]	6.92 ±0.06	7.21 ±0.04	6.71 ±0.04	62	..	..	26.4	1.9	4x10[5]
Ca	7.6 ±0.5	5.5 ±0.5	8.2 ±0.5	74	25	87	6.3	1.6	13.6	6.2 ±0.2	6.0 ±0.25	6.4 ±0.19	22	11	33	....	1.0	.....
Mg	0.75 ±0.10	0.42 ±0.04	0.84 ±0.12	68	0	87	8.5	1.0	13.6	0.65 ±0.06	0.63 ±0.06	0.73 ±0.08	65	67	75	5.4	2.2	9.9
PO[4]	18.0 ±1.4	12.2 ±1.6	19.7 ±1.5	53	25	60	2.6	2.6	9.9	14.4 ±0.6	12.6 ±0.7	15.2 ±0.7	39	11	50	1.0	6.3	.....
Protein	446 ± 46	284 ± 33	489 ± 53	68	25	80	22.2	..	44.8	346 ± 24	315 ± 33	359 ± 39	54	33	67	3.0	1.0	2.2
L.P.	0.52 ±0.11	0.26 ±0.11	0.60 ±0.14	78	50	86	37.4	1.4	44.8	0.20 ±0.03	0.19 ±0.02	0.22 ±0.04	63	78	50	7.3	4.6	3.5
Chol.	11.2 ±2.0	5.3 ±2.1	12.9 ±2.5	57	25	65	3.5	1.0	7.3	10.7 ±0.77	9.2 ±0.7	11.9 ±1.2	82	67	92	31.4	3.0	26.4

Normal values obtained from analyses on subjects who as far as medico-dental clinical and laboratory tests could discern had no ailments—pH: 7.14±0.04. Calcium: 6.3±0.4. Magnesium: 0.46±0.07. Inorganic Phosphate: 15.2±1.0. Protein: 298±17. Lipid Phosphorus: 0.13±0.02. Cholesterol: 7.5±0.7.

* Erosion refers to subjects suffering from wastings: erosions or abrasions.

† Caries refers to subjects with active decay processes only.

nesium, inorganic phosphorus, protein, lipid phosphorus and cholesterol above the high average normal content, again pointing to the probability that the variations are real. Finally, computations for odds against the chance occurrence of differences for the acid group yielded odds greater than 4 for all substances studied and so the suggested statistical significance is verified a third time.

In caries-active individuals variations from the normal are fewer—non-overlapping figures appearing only for pH, magnesium, lipid phosphorus and cholesterol, with values of 6.92, 0.65, 0.20, 10.7 respectively instead of 7.14, 0.46, 0.13, 7.5. Also for caries, there exist apparently two distinct types—one with alkaline saliva, the other with acid saliva. The former presents a

CHART II

The Murry and Leonie Guggenheim Dental Clinic Diet Booklet *

Name

Address

Weight

Height

Date

Diet Record:

Specific foods and accurate amounts of each taken at every meal and between meals

* The dimensions are 4" wide by 8" long.

CHART III

NAME _____ NO. _____ DATE _____ OPERATOR _____

KEY DEGREE OF CARIES 1 ENAMEL ONLY 2 ENAMEL & DENTIN 3 INVOLVING PULP + OR − PULP VITALITY	RIGHT UPPER														LEFT UPPER	REMARKS
			E	D	C	B	A		A	B	C	D	E			
	7	6	5	4	3	2	1 LINGUAL		1	2	3	4	5	6	7	
DEGREE OF CARIES																
MISCELLANEOUS																
RECOMMENDED																
R. RECESSION G. GINGIVITIS T.O. TRAUMATIC OCCLUSION R.F. RAREFACTION R.R. RETAINED ROOT I. IMPACTION M. MISSING TOOTH X. EXTRACTED TOOTH	RIGHT LOWER														LEFT LOWER	
			E	D	C	B	A		A	B	C	D	E			
	7	6	5	4	3	2	1 LABIAL		1	2	3	4	5	6	7	
DEGREE OF CARIES																
MISCELLANEOUS																
RECOMMENDED																

reduction in inorganic phosphate from 14.4 to 12.6 (almost to the same level as in erosion associated with alkaline saliva; pH, calcium and protein remain normal but magnesium, lipid phosphorus and cholesterol are high. On the other hand, differences from the normal are enhanced in the acid saliva subgroup. The pH is depressed to 6.71, magnesium, lipid phosphorus and cholesterol are increased to 0.73, 0.22 and 11.9. Evaluation of the analytical figures by ascertaining the percentage incidence or the odds against randomness showed the same close agreement of the different statistical methods which was indicated for the erosion studies.

CHART IV

Date

Chief Complaint:

Present Illness:

Past History:

Family History:

General Inspection:

Description of local lesion:
(1) Extraoral

(2) Intraoral

Urine:
Blood:
Remarks:

Diagnosis:

Operation:

It seems plausible to assume a common mechanism at work. The results imply a tendency to that type of derangement often associated with acidic states in the body, notwithstanding that the subjects, for the most part, had no other pathological involvement as far as the usual medico-dental clinical and laboratory tests could discern. Detailed perusal of accumulated data, coördinated with the fact that the organism makes every effort to rid itself of acid ions in salt form, led to the examination of the dietary acid-base potentialities in addition to the usual orthodox factors,[1, 14, 15]

In the plan adopted [1] the chief criteria of physiologic response are subjective guides, clinical manifestations (roentgenograms), weight changes and variation in the chemical composition of saliva. To insure saliva samples

CHART V

The Murry and Leonie Guggenheim Dental Clinic
Saliva Analysis

Original Record Card (Side 1) *

Name Dentist No.
Address Address Date
Telephone Telephone
Age Sex Weight Height Race
Religion

General Habits:
Occupation
Hours of work Type of work
Rest: Sleep: Hours restless sound
Diet: Supplementary details of diet not in booklet, such as size of portion, enjoyment of food, appetite, regularity of intake
Water
Medical Examination: Supplementary details of more personal nature previously omitted
Saliva Start End Amt.
Collection
pH (cell)
Under oil
Suction

* The dimensions are 5" wide by 8" long.

which are duplicable and representative of an individual, conditions are set for a definite metabolic plane over at least one week preceding any analyses. They include (1) no recent mishap or illness, (2) thorough brushing of the teeth and washing of the mouth just before retiring the evening preceding each test day, (3) 8 hours sleep during the night prior to each test day, (4) no brushing of the teeth or rinsing of the mouth nor having breakfast (water) or smoking on the morning of each test, (5) a 1½ to 2 hour interval between rising and collections, this interval including a 15 minute rest period at the laboratory, and (6) a detailed record of meals.

Each patient receives the diet booklet represented in Chart II. The pages are individually dated or otherwise marked when necessary. This is returned the morning of the laboratory appointment and filed with Charts III and IV which have been filled out by the dentist.

Samples of saliva are obtained under the standardized conditions outlined. First, a small sample (about 1.0 c.c.) is collected by spontaneous flow for the determination of the pH, which is carried out immediately.[8] Then a large sample (40.0 c.c.) is accumulated with the aid of suction and a saliva ejector. As soon as this is completed, the patient is questioned to ascertain supplementary details noted on the original record card shown in Chart V. At this time a full set of X-rays is taken and a final check-up of the extent of tooth involvement is made. Aliquots of saliva are measured for the analysis of calcium,[9] magnesium,[10] inorganic phosphate,[9] lipid phosphorus,[11] cholesterol,[12] and protein [13] (Chart VI).

The weekly food intake recorded in the diet booklet is analyzed with reference to acidic factors (meat, fish, eggs, cereal, flour products), basic factors (fruits and vegetables with few exceptions), milk and milk equivalents, vitamins, water, and caloric intake (Chart VII). This probable habitual consumption together with the other findings assembled, as noted in Charts II–VI, is used to deduce the additional needs commensurate with the individual's requirements.

CHART VI

The Murry and Leonie Guggenheim Dental Clinic

Original Record Card (Side 2)

Name *Dentist* No.

Analysis: *Whole Saliva* Date

Date	Det	Sample	Reading	Calculation	Result	Final
	pH					
	Ca					
	Mg					
	P Inorganic					
	Lipid P					
	Cholesterol					
	Protein					
	Misc.					

Finally a complete summary is prepared as in Chart VIII. The clinic or the dentist using our consulting laboratory service receives a copy of the entire report for filing and a carbon duplicate of the recommendations given to the patient.

As noted in Chart VIII, the diet is checked for the last week of each month. After the patient has carried out the suggestions for 4 to 6 months, another complete analysis is instituted. Chart IX indicates the return to the normal level of phosphorus (inorganic phosphate), magnesium, cholesterol, and lecithin (lipid phosphorus or alcohol-ether soluble phosphorus) within 4 months. There was no noticeable improvement in the dental condition at this time. Recommendations accentuated somewhat the decrease of potentially acid food varieties. Dental examination 6 months later showed interproximal decalcification arrested and no new cavities.

A sample menu which possesses the balance of nutrients used is presented in Chart X. It was arranged primarily for comparatively low income groups. Changes may be allowed provided substitutions are made from within the same food classes and there is no marked decrease in caloric value unless forced by dire economic stress. A 20 per cent increase in caloric level may be desirable when possible.

CHART VII

The Murry and Leonie Guggenheim Dental Clinic Diet Analysis *

Re: (Patient) Date:

Date									Totals
Acid									
Base									
Milk & equivalents									
Water, juices Broth									
Calories									

Comment:

Age	Present weight	Present calories
Height	Required weight	Required calories

* This record is on a card 5" wide by 8" long.

CHART VIII

The Murry and Leonie Guggenheim Dental Clinic Salivary-Diet Analysis *

Re: (Patient) Date:

I Findings

A Saliva

pH		
Calcium	mg.	%
Magnesium	"	"
Phosphorus	"	"
Protein	"	"
Cholesterol	"	"
Lipid P	"	"

B Diet characterized by

1.
2.
3.

C Physiology

Copy of Recommendations sent to patient

II Recommendations Date:

A Diet

1.
2.
3. Take

	2½	oz. meat or fish		1	large apple
	1	egg		1	" orange
	2	slices bread		1	" pear
	1	inch cube cheese	to	1	medium banana
X Portion	½	cup cottage cheese	Y Portions	1½	peaches or apricots
Only	½	cup cereal or macaroni or noodles or corn	of	4	large dates
				1½	figs
	4	crackers		1	medium potato
	1	inch slice cake		½	cup vegetable (spinach, beet tops, carrot tops 3 times each week)

4. Keep caloric intake at Z.

Values of common foods:			
Meat	2½	oz.	100
Fish	2½	oz.	100
Egg	1		75
Bread	1	slice	40
Crackers	4		100
Cereal or macaroni or noodles or rice	½	cup	100
Milk	1	cup	150
Cheese	1	inch cube or ½ cup loose	100
Potato	1	medium	100
Vegetable	½	cup of carrots, beets, beans, peas or like	75
	½	cup leafy	15
Fruit	1	large apple, orange, pear	100
	1½	peaches, apricots	100
	4	dates	100
	1½	figs	100
	15	almonds	100

B Return for analysis 5 months after diet instituted. During this time send to Dr. Krasnow record of weight and diet for last week of each month.

C Report to Dr. (dentist) details regarding health.

D Have thorough medical check-up before commencing recommendations.

* The original summary is recorded on a card 5" wide by 8" long.

CHART IX

Case Report: 16 C, 15 years old, healthy, excellent home of good economic status

12/6/35	4/1/36	10/10/36
I Findings:	I Findings:	I Findings:
A Saliva	*A Saliva*	
pH * 7.1	pH 7.0	
Calcium mg. % 5.3	Calcium mg. % 5.0	
Phosphorus " " 13.2 Tending low	Phosphorus " " 15.5 Increased	
Magnesium " " 0.62 High	Magnesium " " 0.41 Decreased	
Protein " " 300	Protein " " 306	
Cholesterol " " 10.9 High	Cholesterol " " 6.5 Decreased	
Lecithin " " 0.18 Tending high	Lecithin " " 0.14 Decreased	
B Diet	*B Diet*	
Water, milk low	Milk increased, water low	
Calories somewhat low	Calories increased	
Acid: base 61:45	Acid: base 41:55	
High bread, cake, cereal	Decrease in bread, cereal	
C Dental Report	*C Dental Report*	*C Dental Report*
Caries extremely rampant occlusally and interproximally	Apparently no noticeable change	Interproximal decalcification arrested. No new cavities. Enamel texture improved.
II Recommendations:	II Recommendations:	II Recommendations:
Increase milk to 3 glasses	Increase water intake	Continue with previous advice.
Slowly increase water to 8 glasses	Use pablum instead of other cereal	
Slowly increase vegetables } especially	Substitute fruit for cake dessert	
" " fruits } raw	Use irradiated milk instead of cod liver oil	
Take 2 t cod liver oil		
Decrease slowly bread, cake, etc.		
Keep caloric intake at 1,800		

* The normal ranges are: pH: 7.14±0.04, calcium: 6.3±0.4, magnesium: 0.46±0.07, phosphorus (inorganic phosphate): 15.2±1.0, protein: 298±17, lecithin (lipid phosphorus or alcohol-ether soluble phosphorus): 0.15±0.02, cholesterol, 7.5±0.7.

SUMMARY AND CONCLUSIONS

Concerted interest and action of physicians, dentists, and laboratorians is the keynote of success in health programs. Dental health is no less a resultant of the health of the organism as a whole than it is itself one of the contributing factors. The balanced diet if interpreted as part of a comprehensive scheme will aid greatly in bringing about scrupulous individual hygiene. To do this it is necessary:

1. To learn the detailed needs of the patient with reference to his entire make-up.
2. To recommend diet changes not in generalities but as specific and calculated prescriptions.
3. To institute frequent check-ups in order to obtain the patient's willing coöperation, for without it every effort will be of no avail.

Thus far, the procedure at the Guggenheim Dental Clinic is resulting in data which apparently indicate a nutritional influence on teeth and point to salivary analysis as an additional objective guide for directing the diet change.

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CHART X

Sample Menu for Child of Five Years

Time	*Food*	*Portion*	*Caloric† Value*	*Total Calories*
7:00	Water	¾ glass		
7:15	Cod liver oil	2 tsp.	75	
	Cereal (whole seed)	½ cup	52	
	Molasses	2 tsp.	60	
	Milk (Grade B) *	1 glass	170	
10:00	Carrot or beet * (raw twice a week—slowly increasing to greater frequency)	1	15	
11:15	Water	¾ glass		
12:00	Potato	1 (medium)	100	
	Beet tops (cooked 5 minutes in covered pot with no water added after washing). Green cabbage may be substituted. Raw greens introduced gradually.	⅓ cup	2	
	Bread	1 slice	40	
	Butter	1 tsp.	40	
	Banana *	1	100	
	Water	¾ glass		
3:00	Milk	1 glass	170	
	Cookies ‡	2	50	
6:00	Bean or split pea soup	½ cup	75	
	Turnip or similar vegetable in season	⅔ cup	32	
	Whole wheat bread (24 hours old)	2 slices	80	
	Substituted by:			
	Fish (once a week)	2¼ oz.	50	
	Spleen, heart, lung meat, once a week *	2½ oz.	170	
	Egg (Grade B), twice a week	1	75	
	Butter	1 tsp.	40	
	Fruit in season	1	75	1,176

Candy, ice cream, rolls, fresh bread, cake must be excluded from diet. Total cost of diet is approximately 18–22 cents per day. The schedule may be applied to other non-school ages with proper adjustment of calories, etc.

* Extra milk, fruit or fruit juice, beef and liver desirable if income permits.
† Approximate values only.
‡ Three quarters glass of water now or at 4:30.

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Practical Procedures in School Health Service*†

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HOW does an executive of any organization, public or private, find out whether his department is doing an effective job? This is a practical inquiry. Complacency and self-congratulation have little place in modern administrative jobs. The administrator must know to what degree he is successfully reaching his objectives. The question is—how to make the evaluation.

If the organization is large the executive has many departments. Each of these during the course of time has built up files filled with executive orders, statements of policy, bulletins, and manuals. These materials, each in its own special time, met a certain need. Many of these needs, however, belong to the past, for new concepts, new theories of procedures, new technics, and new social forces have been introduced into the picture.

Besides the handicap of outmoded regulations there is the handicap of the attitudes of the staff for whom these regulations have become "sacred cows." Often, unfortunately, the "sacred cows" of the various departments are tethered in widely separated fields. It becomes administratively difficult and expensive to give them the care they constantly need for survival. The executive of the division cannot keep watch over them. It is impossible for him to see that their services are no longer valuable and that their maintenance is depriving his modern organization of the sustenance and energy necessary to do the job.

He knows that a well trained staff and good physical equipment make for effective service. The executive in the field of education is aware, however, that good teaching is not synonymous with authors of textbooks or marble halls and stadiums. Nor is superior performance in public health necessarily associated with high-powered publicity, expensive clinical equipment, elaborate statistical records, or vast numbers of personnel. The test of an organization's efficiency lies in its total effect upon the end product. In education and public health the test lies in the degree to which changes in a positive direction have been made in the behavior of people.

If the administrator feels that his department is not effecting such changes, he wants to know why. Is it because of poorly trained personnel, lack of personnel, lack of facilities, or

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* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

† This study is sponsored by the Department of Health and the Department of Education. Its direction and administration are under the School Health Study Committee of the Committee on Neighborhood Health Development.

because the mechanics of the administrative system itself are so permeated with tradition and imperfections that neither personnel nor facilities can function?

Consider now the specific problem of investigating the effectiveness of the school health service. (For our purposes it matters little whether that service is furnished by the department of health or the department of education.) The administrator responsible for the service is confronted by the fact that he has at least five professional groups involved, each under its own professional leadership. These are the school physicians, the school nurses, the clinic personnel, the teachers, and the private physicians. Where shall he start?

Several courses are open. He may call in an expert to make a survey. He may use the School Hygiene section of the A.P.H.A. *Appraisal Form* to determine the degree to which the service is meeting certain standards. He may make a statistical comparison between the school health activities of his city and those of other cities. He may ask his supervisors to give him data from which new policies may be envolved. Any one of these methods gives the administrator needed information and is certainly far better than making no attempt at self analysis. They have, however, serious weaknesses.

First of all, the use of any of these methods fails to go below the surface of operations in the school health field.

Second, the validity of oral or written reports obtained from the supervisory staff is questionable. The reports are vitiated by complex psychological factors, common in this situation, such as (1) the desire to make a good impression; (2) the belief that the service actually is functioning as represented although no check has been made; (3) "wish fulfillment" which operates in such a way that desiring a given result and stating it as having been accomplished become identical in the mind of the person questioned; (4) "defense mechanisms" whose automatic functioning serves to preserve the *status quo* and to keep the "sacred cows" unharmed.

A third weakness lies in the unreliability and lack of usefulness of certain statistics in the school health field. Studies by the American Child Health Association show that physicians markedly disagree in their diagnosis of tonsil defects. The number of malnutrition cases found depends on the procedures used in examination and on the attitudes of the medical director. Figures on dental defects and their corrections are usually useless. Only when the original recordings are the result of a careful dental examination, and each child is seen repeatedly during a year can a true picture be obtained of the service being rendered. Even when the statistics are reliable they may not give the administrator the desired information.

The director of a division of school nursing may be interested in the average number of home visits made by a nurse during a given period, but she and the administrator rightfully raise the question "How valuable in changing health behavior were these visits?" Statistics do not answer this question. Statistics may show that a school physician examines 15 children or 50 during a morning. Neither figure gives the medical director or the administrator insight into the value of the medical services rendered or the type of educational job done with teacher, nurse, and parent in getting the child on the pathway to correction. In other words the statistics usually obtained, although useful for general administrative purposes, fail to reveal either the quality of work done or the specific places where the complex administra-

tive procedures fail to function effectively.

There is, however, another method available to the administrator, one that will give him information basic to developing a school health service in which medical, nursing, and educational staff can carry out the best modern theory and practices known in the school health field. This, for the lack of a better name, may be called the method of "administrative research." It is administrative in that it concerns itself only with problems whose solutions have direct bearing on the functioning of the service. It is research in that the methods employed in solving the problems are frankly experimental and that recommendations made to the administrator are outcomes of problems discovered, analyzed, and given trial in the field.

The larger the organization the more important it is that someone capable of independent and impartial judgment be detailed, not in the central office, but on the firing line to observe what is actually taking place, to sense the gaps and the impractical. Here is the place to work out smooth functioning. The administrator—whether director or supervisor—is usually pretty well occupied in keeping the engine running. He has neither the time nor the opportunity to delve or to cut and try. These opportunities for administrative research within the growing organization are believed to have practical values that equal the demonstrations of new activities.

This "administrative research" method is being tested at the present time in New York City for its effectiveness in aiding the Department of Health and the Department of Education to evaluate the present school health service and to develop a better one. One health district has been designated as the experimental area for this purpose. Here studies are made, procedures are put on trial, and results are evaluated. The assistant superintendent of education for the area, the director of health education, the directors of the nursing and school hygiene bureaus, the director of district health administration and their respective field supervisors act in the capacity of advisers and censors. They suggest or approve problems to be studied; they make administrative shifts in procedures and policies that the experimental work may proceed; they consider the significance of the results of the experiments and, when conclusive, incorporate them in remaking city-wide policies. The entire value of the study depends upon the degree to which individual administrators of the divisions of the service are given aid in solving their own administrative problems.

This study in "administrative research" has been planned for a period of 4 years. In a school health service of the proportions of New York City this period is not long enough in which to explore and test the many phases of the work. One year of the 4 has passed. Examples of the problems studied and recommendations made during this period will serve to give an idea of the types of services this approach affords.

To learn, first of all, how existing school health records were being used was the first problem of the study. The monograph, "Physical Defects—The Pathway to Correction,"[1] states that "all health records must be vital." By this is meant, records which are accurate, cumulative, and subject to interpretation by teachers and nurses. Present and future medical attention for any child depends on such records. So does the much talked of rapport between teacher and nurse, rapport between nurse and parent, and between school physician and private physician. Poor records and lack of records mean

poor service and lack of coördinated service.

The exploratory work on the problem of records was confined to one large school in the experimental area. Samples were taken of all available health and medical records for the following grades—kindergarten, 2nd, 5th and 7th. The analysis of the records revealed answers to the questions: (1) How complete are the medical files for children now in school? (2) Is the system now being used efficient in transferring school medical records from school to school for the constantly moving school population? (3) Do teachers and nurses in their separate reports indicate that they individually or together are following up defects for the same children? (4) Are the dental, eye, and cardiac clinical records entered on the regular school health record? (5) What use is made by the medical staff of teachers' written observations or reports on health conditions? (6) What use is made by the teachers of the medical records kept by the school medical staff? (7) To what degree do the medical cards give *differentiated* or *individualized* recommendations as to the "follow-up" procedures to be used? (8) Are the entries on the cards readable and understandable by nurse and teacher?

It had been assumed that records followed a child from one school to another when he moved. Actually, it was discovered on investigation that a surprisingly large number of record cards did not move on but died in a terminated file in the last school attended. And in some schools from 30 to 50 per cent of the pupils move annually. This situation called for a simple yet laborious job of revamping the files for ready reference and devising a practical plan for moving cards along with the children. This involved (1) providing a cumulative health record card for every child, which would go with him into the secondary schools; (2) instituting a more precise and accurate filing system of medical cards so that teachers may have available at any time the medical records for their grades; (3) sending the medical cards at the beginning and end of each term to the classroom teacher that she may be aware of the health problems known to physician and nurse, and that she may note on the card the grade and room to which the child is being transferred.

Serious lack of agreement in the knowledge of defects between teacher and nurse was revealed. Independent action was being taken on the same child. An experimental study was started immediately to determine the best way to coördinate this knowledge. The Department of Education in New York City has for many years asked its teachers to report twice yearly concerning the physical defects of the children. This report is made on a Health Day Sheet. In the experimental school this Health Day Sheet was changed so that teachers, instead of reporting *diagnoses* of defects, reported on the presence of *behavior symptoms related to health*. Pediatricians believed these symptoms would furnish important case history data to the physician making the diagnosis. To evaluate the teacher-references on this new basis and to test the value of the individual symptoms reported by the teacher became a major project. Eight classes comprising 300 children were selected for the evaluation. The results showed that teachers did not "swamp" the medical office with children. They referred children for medical attention who needed it. Only 10 per cent of those referred were found by the physician to have no defects. The error of reference lies in the cases *not referred* for medical attention. Of the 100 children in this

group 25 were considered by the examining physician to have some defect meriting immediate attention. Further checking during this next year will show whether or not the defects of these 25 children would be lost from sight altogether by this reference method or whether they would come to attention later through referrals by subsequent teachers.

The experimental evaluation showed too the weaknesses of the various symptoms on the Health Day Sheet and indicated specifically where stress must be placed in developing a new Health Day Sheet and in educating teachers to its use.

The study had less objective results but equally important ones. It showed that in using the teacher as a primary screen, (1) knowledge and reports of defects by teachers and medical staff become identical; (2) the physician has a personal professional interest in the child examined because he feels that a *need* for the examination has been expressed; (3) an avenue is opened wide by means of which the school physician and the school nurse may, through their subsequent conferences with the teacher, instruct her in making more valid health observations of her children, inform her as to the recommendations made to the parent concerning each defect; and gain her coöperation. In addition, these same conferences serve the purpose of bringing to the medical staff the instruction it needs in becoming aware of the emotional, social, and educational life of the child. Such information is necessary if the school health service is to meet the objective of really educating child and parents. This objective must not be neglected nor ignored.

Plans for next year call for an extension of these procedures with the new Health Day Sheet to 7 other schools differing widely in economic status. Each of these schools offers different administrative problems affecting the objective of bringing the teachers and medical staff into a close working relationship. Not until such testing is done can recommendations for administrative changes be made.

Minor investigations were made of the efficacy of various notes embodying requests to parents concerning the child's health. It is generally agreed that placing a child, when possible, under the supervision of the family physician is a desirable objective of the school medical service. In the usual program the administrator formulates a letter urging the parents to have the child examined by the family physician. This letter may or may not be successful. Experimental work with different types of letters showed that whereas 15 per cent of the parents complied with the request for one type of letter, 65 per cent complied with another type. Similarly a good health service implies that the presence of the parents is desirable at all medical examinations given in the school; it further assumes that in many situations parent-nurse conferences in school are more satisfactory than nurse home visits. After trying out several types of notes to parents urging them to be present at the examination or to come to the school for a conference, two were selected. One of them brought 50 per cent of the parents to the school for the examination; the other succeeded in bringing 75 per cent of those not attending the examination to the school for conferences. Thus, with approximately 85 per cent of the children examined in school, immediate contacts were made with the parent in initiating remedial work for the child.

It has been assumed that certain routines when followed by a dental hygienist bring results. No measures of the amount of effort to achieve these results have been made in earlier studies. In order to estimate this

effort, 200 7th grade children were selected for a study. The following routines were carried out in the order given. First the child's teeth were examined and a notice was sent to the parents; the child was then seen by the dental hygienist 3 times at regular intervals to ascertain what was being done; next a special request was sent to the parents urging them to come to the school for a conference; finally, the child was referred to the assistant principal. Any child placed under dental care at any one stage of the routine was naturally not carried through the other stages. Detailed records give a measure of the amount of effort required to get a child's teeth corrected or under treatment. The study gives, too, an index of the problems encountered with children who failed to place themselves under treatment even when all of the above "follow-up" technics were employed.

A school health program always includes "follow-up" procedures. These may be of several types, such as conferences with parents at school, home visits, notes sent home, and instructing and re-checking the child in school. How effective is any of these methods for a special type of defect? To answer this question, at the conclusion of the year a study was made of the 2,400 medical records in the experimental school to find out the *types* of "follow-up" work done with parents and child by physician and nurse which had least success in getting medical attention for the child. Considering each defect separately an analysis of the "follow-up" work shows immediately that certain procedures bring few if any results, and that "follow-up" policies must be different for different defects. Experimental work during the coming year will furnish answers as to what these procedures should be.

Even in the simple problem of getting Mary Smith to the dentist at least 7 people are usually involved—the school physician, the school nurse, the teacher, the two parents, the private dentist, and Mary herself. And the number of interrelationships between these people is many more than 7. It is only when a realistic attitude is taken toward complexities such as these, so that these interrelationships are recognized and appreciated, that Mary Smith will finally get her teeth filled, her glasses re-checked, and eat her breakfast before running to school. To demand efficient functioning of these detailed steps for one Mary Smith may seem too meticulous. It is indispensable for good administration when there are thousands of Mary Smith's.

Certainly, then, the complexities of the school health program suggest that no schema conceived in *a priori* fashion will work satisfactorily when it is put into operation. Here as in other complex problems of social welfare in which many different people work, many different agencies are concerned, many different types of people are to be served, the job calls for developing the program from the ground up, not from the top down. There is room for much more study of what may be called "internal management" within the school health service. This type of activity may be the best means of meeting some of the shafts of criticism that have been directed against the school health service.

REFERENCE

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Education of the Handicapped Child*

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THE term handicap at once suggests disease or disability and tends to establish medical control. On the other hand, education suggests the orderly development of assets, and teachers are necessarily looking at what is left rather than what is gone. There is no possible use in a discussion unless it is recognized that training of doctors is very different from that of teachers and that effective coöperation is dependent on understanding of necessarily divergent attitudes.

For the purpose of this discussion the term handicapped is limited to the group of children with disabilities dependent on damage to the motor machinery of the body; in other words, the group which is frequently referred to as the cripples. This definition leaves out of consideration the blind, the deaf, and those whose disabilities arise from disturbances of mental and emotional equipment.

Everyone of this restricted group comes first under medical scrutiny, so that the doctor's decisions and his attitudes are of enormous importance. It seems to me very clear that the medical attitude at the start is one of the things which influence the whole educational process, and some understanding of it must precede further discussion.

Traditionally the physician tries to arrive at a clear understanding of the following aspects of a case.

1. The status of the child at the time of examination. Primarily this is expressed in terms of deficit. This insistence upon deficit or disturbance, either anatomical or physiological, is entirely inevitable and correct since it leads to decision as to whether the process causing the difficulty can be arrested or its effects can be corrected. Furthermore, the appraisal of deficit leads to proper classification or "diagnosis."
2. A search for the cause is made. This is the "etiology" of the medical vocabulary.
3. The ordinary course of the disease or the ordinary effect of deficit is then considered in terms of "prognosis."
4. Treatment designed to control an active disease or to ameliorate the disability is finally considered.

On the whole, the doctor is discharging his most obvious responsibility when he has competently appraised and managed deficits. The problem is then frequently handed over to a new group who attempt to develop the remaining assets.

Efficient teamplay between doctors and teachers is possible even under these conditions, if it is possible to arrive at a valid residue by an agreed formula. For instance, it is quite possible to carry on education of a child whose right arm is completely disabled by infantile paralysis. The psychological integrity of the child and the efficiency of the remaining limbs can be assumed. The industrial effectiveness of the assets and liabilities can be appraised and no confusion exists.

The difficulties pile up rapidly, however, when the medical appraisal is

* Read at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

either inadequate or is not easily translated into terms of remaining assets. The doctor must deliberately attempt to add a very difficult section to his formulation. He must, I think, try to define the remaining assets so that the psychological and physiological remainder will be understood by those who are responsible for education.

Fortunately the problem of infantile paralysis lends itself to accurate study. Essentially the disability is due to the subtraction of a certain number of units of motor function from a known total of identical units. The deficit can be calculated and the remainder obtained by the familiar process of subtraction. By development of remaining muscular tissue, by substitution of apparatus for lost fibers or by fixation of joints, a maximal efficiency can be reached. The fact that infantile paralysis is common and that the medical deficit is easily translated into terms of educational assets, leads, I think, to a feeling that the same process can be applied with equal effectiveness all along the line.

There is a second group, fortunately less common, where a disease, in the ordinary sense, is still active. Certain children have, for instance, tuberculosis of joints. Here the motor disability is only one factor. It is impossible to deal with the child on any basis which assumes that the balance-sheet is more than an expression of opinion concerning the immediate status. Obviously the responsibility of the physician is continuous and the teacher is unable to work out long-time plans with any security.

A third group, fortunately still smaller than the last, have remorselessly progressive disease. The child with progressive dystrophy, for example, has constantly decreasing assets. There is not confusion since again the conclusions of the doctor as to increasing deficits are easily understood.

The next group, which is relatively large, is much more difficult to manage. Injuries or disease of the brain, with consequent disturbance of motor control are not uncommon. Cerebral palsy is perhaps as useful a name as any for this group. In general, the cause is a diffuse abnormality of the brain due to various causes of which injury at birth is probably the major one. For obvious reasons it is desirable to ignore in the discussion two major groups—first, those whose intellectual equipment is not adapted to educational procedures, and second, those under continuous medical care because of advancing symptoms.

The children who are relevant suffer, not from isolated abolition of motor function, but from confusion of control of motor function. Obviously a mere process of subtraction will not give us a clean-cut picture, even of the motor deficit. The medical formula in terms of anatomical deficit is complicated. The appraisal of physiological disorder is also difficult. In addition there is almost always an intellectual irregularity or deficit. The duty of the doctor seems to me an arduous one. If endless confusion and frustration are to be avoided he must arrange his material so that his conclusions can be effectively used by parents and teachers. He does not discharge his responsibility until he has indicated the remaining physical and mental assets, suggested a type of training compatible with these assets, and discussed the probable ultimate level of efficiency.

I have no illusions about the difficulties of management of crippled children. Failure of the best known procedures is inevitable in certain cases, but the next step which is being taken in various places is to recognize that the doctors, instead of confining themselves to the appraisal and management of defect, must coöperate

with psychologists, psychiatrists, and teachers in formulating a conception of assets. If they succeed they can then coöperate in the planning of an educational routine which will lead toward an attainable goal.

Two equally confusing and dangerous attitudes are common: The irrepressible optimist sees no limits to the spiritual or intellectual achievement of the crippled child; the almost certain result is frustration and disillusionment if remorseless limitations have been overlooked. The pessimist who looks with pitiful despair on the poor broken children, is equally deplorable.

Doctors, teachers, and psychologists ought to be able to define liabilities and assets of individual children and to get away from generalizations which are inaccurate and misleading. Until such concerted efforts are carried out in all centers for the care of crippled children, we will have no reliable progress. Inspirational talks arouse interest, but furnish no solid basis for adequate educational planning.

Fatal Accidents in 1937

ONCE again, as the year draws to a close, we scan the national accident record. Once again the verdict is unsatisfactory. This is now clear, even though all the records are not in. Every indication, particularly the index of the National Safety Council, points to a toll of around 104,000 killed in accidents of one kind or another, the highest figure for any year with the single exception of 1936, when, according to the National Safety Council's estimate, the all-time high figure of 111,000 deaths was reached. As compared with this record figure, 1937 showed a recession by more than 6 per cent.

Accident fatalities in the home or in public places (exclusive of motor vehicle fatalities) apparently were lower in 1937 than in 1936. Motor vehicle and occupational accident fatalities, on the other hand, increased.

The ugliest feature of the accident situation was a rise of about 2,000 in the number of motor vehicle fatalities, bringing the total to the unheard of figure of 40,000 deaths in one year, a new high record.—*Statistical Bulletin,* Metropolitan Life Insurance Co., Dec., 1937.

Measurement of Sanitary Ventilation*†

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ABILITY to modify man's environment is not confined to the enhancement of comfort, convenience, or even safety but extends to the prevention of disease and the promotion of health. By supplying pure water and pure food, the sanitary engineer has, in many communities, almost eliminated intestinal infection. Is it unreasonable to hope that, when air-borne infection is better understood, diseases conveyed through the respiratory tract may likewise be reduced through the provision of pure air supplies?

Experimental evidence has accumulated during the past few years which brings this possibility within the realm of the engineer.[1] It has been shown:

1. During coughing and sneezing, minute droplets containing microörganisms from infected surfaces may be ejected into the air.[2]
2. Most of these droplets are sufficiently small to evaporate before they can settle to the ground, leaving suspended in the air minute residues.[3]
3. These nuclei, in which the microörganisms remain viable for considerable periods, may drift in air currents as would particles of cigarette smoke.[4]
4. The air breathed commonly by the various persons congregated in a room or other enclosed space can thereby transfer these organisms from one person to another and plant them upon the susceptible tissues of the respiratory tract.[1]

The engineer may, therefore, proceed upon the assumption that drifting particles arising from common occupancy of enclosed spaces constitute a hygienic hazard, which may be reduced through the elimination of the microörganisms thus suspended in air. Where individual supplies of air can be furnished to each person, the problem of air-borne infection disappears. Blackfan and Yaglou [5] report spectacular reduction in acute and chronic infection of premature infants, chiefly respiratory, by the installation of a separate air-conditioned supply to wards for premature infants. The Chapple incubator [6] by providing an individual supply of pure outside air to each infant attains this theoretical ideal, for even the nurse is excluded from the child's atmosphere. Whether the principle of the individual air supply can be profitably prolonged beyond the premature into the normal life span is a problem of hygiene as well as engineering. The practicability of a cabinet cubicle for infant care in nurseries is now being studied by Dr. Chapple in the Laboratory of Air Hygiene at the Children's Hospital, Philadelphia.

In general, however, the engineer must provide for common occupancy of enclosed spaces. The magnitude

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† This study is supported by a grant from the Commonwealth Fund to the University of Pennsylvania for investigations on air-borne infection with the laboratories in the Department of Bacteriology, the Children's Hospital, and the Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis.

of this hazard depends upon the degree of confinement of the air common to many persons, or rather upon the concentration of the contaminating nuclei, which varies directly with the number of persons occupying a given volume of air (and their specific infectivity), and inversely with the dilution either with pure air from without or with any other equivalent means of elimination of the microörganisms, such as precipitation, filtration, washing, physical or chemical disinfection. As Colvin has said,

> The fundamental factors in prevention or control of droplet infection become evident. Dilution of the droplets by air space or change of air provide the barrier, *i.e.*, proper space for each one, especially in sleeping, and proper ventilation.[7]

Sanitary ventilation may, therefore, be defined as the rate at which microorganisms are vented; or as the proportional air replacement which would remove the equivalent number of microorganisms eliminated by any other means.

METHODS OF MEASURE OF EQUIVALENT VENTILATION

With the modern technic of sanitary air analysis,[8] the equivalent air replacement can be simply determined. A diluted culture of the test organism is thrown into the air by an atomizer (Figure I) which may be designated the infector. Following the instantaneous evaporation of the droplets, the contained bacteria remain suspended in the air like an invisible smoke. The bacterial concentration may be determined by the air centrifuge,[9] which represents a mechanical infectee. The specific technic is contingent upon the dimensions involved.

B. coli is a convenient test organism: it is harmless; it is easy to culture, and we have in eosin-methylene blue agar a selective medium in which *B. coli* grows readily but which is in-

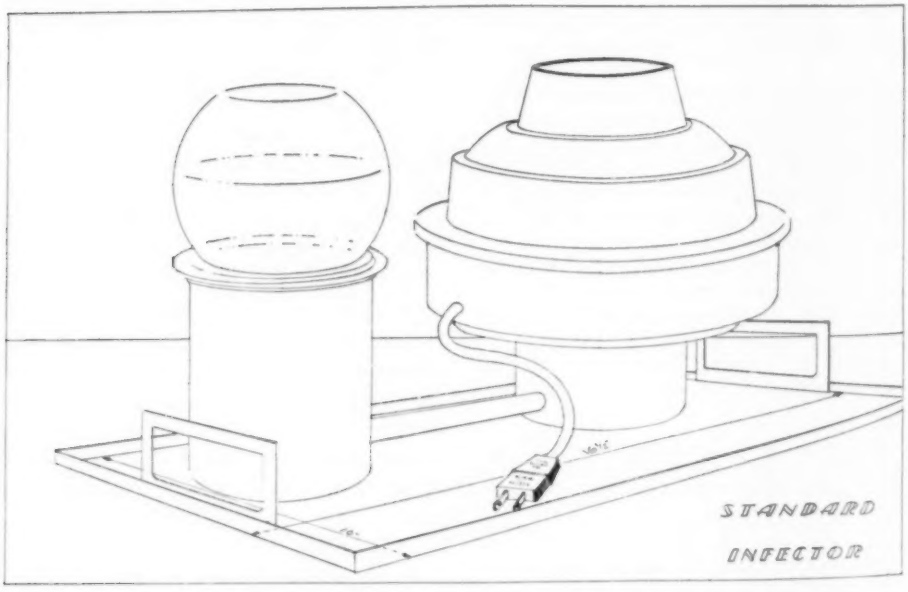


FIGURE I—Atomizer adapted from special assembly of humidifier by William Feldermann, American Gas Accumulator Co., Elizabeth, N. J.

hibitive to other organisms in the air (in these tests, contaminants); on this medium the colonies are readily counted [10]; it grows singly; it is not a normal inhabitant of the air, and one can be sure that the organisms recovered by the centrifuge were put there by the atomizer.

It becomes possible, therefore, by a suitable technic to measure directly the degree to which an infector at any point in a confined space infects an infectee at any other point under given conditions of ventilation. By comparing these measurements under varying conditions of ventilation we are provided with a quantitative instrument for measuring sanitary ventilation as defined above.

Two general methods are described which make it possible to study specifically the conditions which facilitate or impede the passage of infection from infector to infectee and to determine the efficacy of any means for preventing or reducing such passage of microorganisms. These measurements may be compared to the effect produced by removing from the confined space a given proportion of the volume of air in a chosen unit of time, the removal rate giving a unit of equivalent ventilation. Replacement of the confined air by outside air or air from other parts of the building by natural or artifical means, or removal or destruction of microörganisms within the air, all can be expressed in terms of equivalent ventilation.

I. Method of the Die-away—The simplest method for determining the ventilation rate is to build up within a room a desired bacterial concentration by atomizing a diluted liquid culture of the test organism; the atomizer is then turned off and consecutive samples of the air are taken.[8] Since with uniform ventilation the number of organisms removed in a small unit of time is proportional to the number present, that is:

$$dN = -KNdt$$

it follows that

$$\log_e \frac{N}{N_o} = -Kt \text{ and } N = N_o e^{-Kt}$$

The difference between the logarithms of two counts divided by the elapsed time between the two samples gives the value K. The value K as thus determined by using natural logarithms becomes the rate at which microörganisms are being vented and therefore a measure of sanitary ventilation. If we express time in minutes K then represents the proportional air replacement per minute which would vent an equal number of organisms and therefore becomes a unit of equivalent ventilation. Multiplied by 60, the equivalent turnovers per hour as understood by the ventilating engineer can be ascertained.

Since K is more conveniently calculated by common logarithms, the K so determined must be multiplied by 2.3 to obtain the equivalent ventilation as given above, or the K is multiplied by 138 (2.3 x 60) to obtain the turnovers per hour. The working rule for obtaining equivalent sanitary ventilation becomes: *the number of overturns per hour is equal to 138 times the difference in the logarithms of two counts divided by the elapsed time in minutes between the two counts.*

II. Method of Equilibrium—If an infector contributes bacteria to the air at a uniform and constant rate, the number within the space will increase until the number removed will equal the number added in a unit of time. If the number removed, as given by the *method of the die-away*, is a constant proportion of the number present, it follows that when the rate of removal multiplied by the number present equals the rate of addition, equilibrium will have been reached. The concen-

TABLE I

Laboratory of Sanitary Ventilation for the Study of Air-borne Infection
Routine Test of Sanitary Ventilation, 1/10/38

Infector on continuously from 3:27 P.M. to 4:27 P.M., atomizing a 22 hour culture of *B. coli*, diluted to 5 per cent

	Tube	*Time*	*Temp. ° F.*	*R.H. %*	*Logarithm of Counts*					*Overturns per Hour*
Equilibrium: 12" quartz mercury Geissler tube on at 3:32 P.M., center of room, reflected upward above eye level	I	3:33–38	69.0	47	3.7163	C/K_1	K_1/K	K_1/K	K_1	
	II	3:39–44	69.5	48	**3.6379**	3.3651	.9859	9.7	.8410	116
	III	3:45–50	69.5	48	3.5729	(asymptote)				
Equilibrium: therapeutic carbon arc projector,* screened through Corex D glass, throwing beam across room	IV	3:52–57	69.5	50	3.6091	C/K_2	K_2/K	K_2/K	K_2	
	V	3:58–03	69.5	52	**3.8587**	4.0840	.2670	1.9	.1647	23
	VI	4:04–09	69.5	52	4.0840					
Equilibrium: lights off	VII	4:10–15	69.5	52	4.2781	C/K		C/K	C	
	VIII	4:16–21	69.5	53	4.3160	4.3510		22,450	.1850	
	IX	4:22–27	70.0	54	4.3338	(asymptote)				
Die-Away: lights off, infector off	X	4:28–33	70.5	52	4.0700	K			K	
	XI	4:34–39	70.5	52	3.4035	.1111			0867	11.3
	XII	4:40–45	70.5	52	3.0298	.0623				
						Av .0867				

Test room: 20′ x 20′ x 12′; 3 windows on one side, 1 on another; 3 doors on other two sides—all closed
Atomizer placed near center of 3 window side, 8′ from floor; heating radiators beneath created an up-draft; ordinary home electric fan blowing toward atomizer created a cross-draft
Centrifuge at opposite side of room from atomizer, 3′ from floor
* Note: Same lamp without Corex D filter gave in another test 537 overturns per hour

tration in the room when equilibrium is reached, therefore, is equal to C/K where C is the addition rate and K is the removal rate (given by the method of die-away).

If a ventilating factor is changed, then the new equilibrium will adjust itself in accordance with this equation, and by dividing the number per unit volume obtained under the two conditions of equilibrium, the addition factor cancels and the removal rates will vary inversely with the equilibria reached. If any removal rate has been determined by the die-away curve, removal rates obtained with other ventilating factors may be readily compared by the ratios between the equilibria obtained by test.

For example, under three consecutive conditions of ventilation we obtain equilibria C/K, C/K_1, and C/K_2 from which K_1/K and K_2/K can be obtained by division. These ratios multiplied by K, as determined by the method of the die-away, give the values of K_1 and K_2.

(In the sample test, the elapsed time between samples is 6 minutes. The counts are conveniently computed into logarithms as given in the record. The difference between logs X and XI, or XI and XII, divided by 6 gives K. Subtracting from the log of C/K, log C/K_1 and log C/K_2 gives log K_1/K and log K_2/K, from which K_1/K and K_2/K are obtained. Multiplying by K, as determined from the die-away, gives K_1 and K_2. Multiplying K, K_1, and K_2 by 133 gives overturns per hour.)

The time required for an equilibrium to be reached is theoretically infinite but under practical conditions can usually be obtained within a reasonable period. It is possible,

however, to express the number obtaining at any time after the commencement of the addition by the formula:

$$P = \frac{C}{K}(1 - e^{-Kt})$$

which reduces at zero time to zero and approaches an asymptote C/K as the time is prolonged to infinity. It will be further seen that the greater the value of K, the more rapidly does the number approach this asymptote.

It may be inconvenient to solve for the value of C/K by determining the shape of this curve, and yet the time required to approach the practical equilibrium may be longer than desired in making a test. The accurate determination of three points at equal intervals, as by taking three consecutive samples, permits the computation of C/K. Bacteriologic analyses ordinarily are not sufficiently precise to locate the asymptote accurately, but this relationship assists in the graphic location within the accuracy demanded in practical tests. It is characteristic of this curve, whether increasing or decreasing, that the product of the extremes minus the square of the mean divided by the sum of the extremes minus twice the mean gives the asymptote C/K. Thus if x, y and z are tube counts of three consecutive air samples taken with equal intervals between (see sample test), then:

$$\frac{xz - y^2}{x + z - 2y} = \frac{C}{K}$$

(In the example, counts I, II and III can be substituted for x, y and z, and so also can counts VII, VIII and IX. When, however, the formula is applied to counts IV, V and VI, the deviation of the count of one tube destroys the natural sequence for the solution is found by inspection to be unreasonable. The equilibrium is therefore assumed to be reached with count VI, although a more experienced judgment might apply a graphic correction.)

Because of individual variation in death rate of organisms in the same culture, and other technical factors, the technic must be standardized as far as possible to assure closely comparable results. The dimensions given by this typical test have been found by practical experience to yield reproduceable results.

BACTERIAL VENTILATION BY ULTRA-VIOLET IRRADIATION

A. Irradiation of Recirculated Air—The irradiation of recirculated air constitutes a simple case of bacterial ventilation by means of ultra-violet light. If the efficiency of such ventilation is determined by samples taken within the recirculation system before and after irradiation, the fraction of the bacteria removed represents the fraction of the recirculated air which may be assumed to replace by pure air the contaminated air of the room. Equivalent sanitary ventilation is thus limited by the rate of recirculation. If only 10 per cent of the air is recirculated per minute, the highest equivalent ventilation by any system of purification or by supplying entirely fresh outside air would be 6 turnovers per hour. Compared with the sanitary ventilation obtainable by treatment of the whole volume of air of occupied spaces (discussed under B and C and D) this fractional method of replacement of room air with pure or purified air by mechanical means, hitherto available to the ventilating engineer, is completely out of range. (In the sample test (Table I) a ventilating equivalent of 116 turnovers per hour was easily obtained, and other routine tests could be selected showing several thousand turnovers per hour.)

In special cases, such as railroad cars,* the rate of recirculation may be as high as 20 turnovers per hour, and therefore the irradiation of the recirculated air provides a feasible method of sanitary ventilation, especially since the occupancy load is high and usable space is greatly restricted.

B. Direct Irradiation of Room Air—In the previous case the change in the room air is given by a percentage reduction of a percentage recirculation.

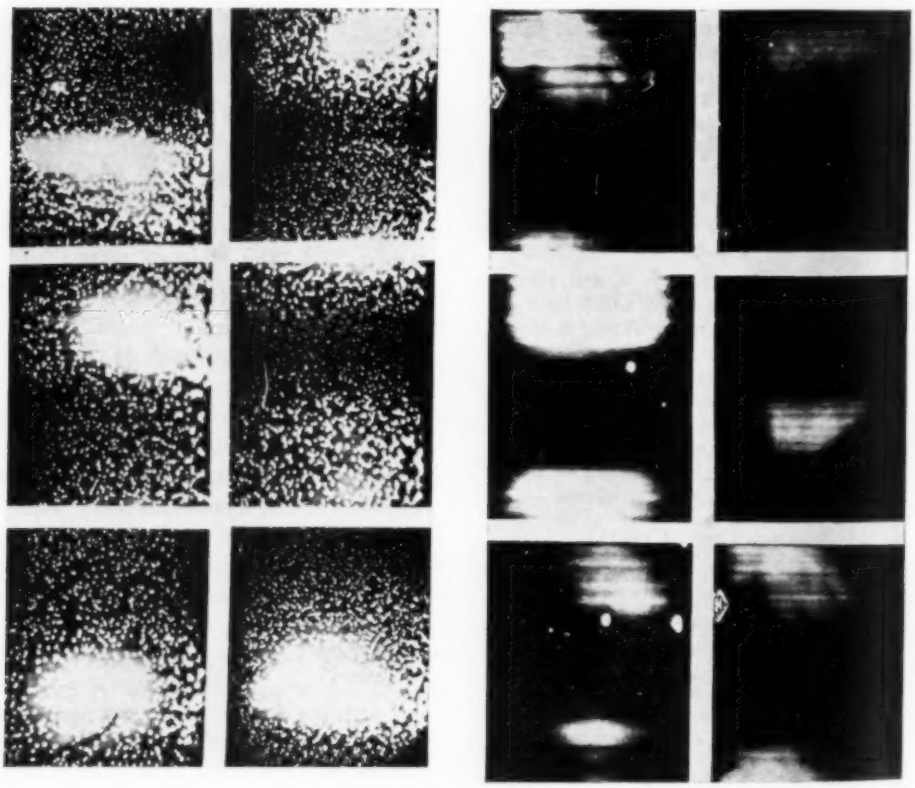
* A study of the purification by ultra-violet radiation of the recirculated air of railroad cars is being conducted in collaboration with S. M. Anderson, Research Engineer of the B. F. Sturtevant Co., Hyde Park, Mass.

Direct irradiation of the whole room is far more effective in the special instances where the eyes of the occupants can be protected. An operating room furnishes a special instance of such irradiation, since the discipline maintained permits responsible protective measures. Here reflectors containing the burners, installed in the angles where ceiling and walls meet provide general irradiation of the major portion of air in the operating room, and throw a broad beam of ultra-violet light onto the operating table.*

Such an installation may be tested by placing the infectee in the center of the room at the level of the operating table (this being the critical point of protection); by continuously infecting the air with an infector placed successively in each corner of the room;

* This type of installation has been under test by Dr. Richard Overholt, Department of Theracic Surgery, New England Deaconess Hospital, Boston, Mass., for about a year.

FIGURE II—Photographic projections of actual centrifuge tubes obtained in routine test on operating room. Tubes represent 10 minute samples with 1 minute interval between. Tubes I (omitted from picture), II and III represent build-up of bacterial concentration without lights, with infector in each of three corners successively. Lights turned on at end of each 3rd sample and off at end of each 5th sample before moving infector to another corner of room. Infector ran continuously throughout test.



Tubes II *Tubes III* *Tubes IV* *Tubes V*

LIGHTS OFF LIGHTS ON

and testing each location of the infector with the lights on and the lights off. The ratio of the equilibrium counts obtained with the lights off and the lights on then gives a measure from which the sanitary ventilation attributable to the lights can be calculated. Their power actually determined under such circumstances by the method of equilibrium, appears fantastic when converted into equivalent ventilation units, and can be better illustrated than computed (Figure II).

C. Partial Irradiation — Direct irradiation applies to special cases. The general problem of the sanitary air control of schools, institutions, etc., can be solved by partial irradiation, where the space without the eye zone is directly irradiated. The irradiation of the upper air of a room may be regarded as equivalent to removing the ceiling or ventilating upward instead of by windows if the air circulation could then be comparable to that in a room. The disinfection of the air in the unirradiated zone depends upon air movement through the irradiated space, as well as upon the spatial distribution of the radiation.

Careful design, operation, and regulation, though necessary in all sanitary light installations,* are of particular importance with partial irradiation because efficiency rests primarily upon the relationships established between the irradiated and unirradiated portions of the room. The integrated product of intensity and time of exposure for all the living organisms within the space which determines the number killed,[2] mathematically predictable in ideal geometric configurations,[1] must be bacteriologically determined in the practical solution of partial irradiation. The routine test illustrates how determinations between different points with lights on and lights off can be converted into equivalent ventilation.

Until opportunities to test buildings specially designed for irradiation become available, experience gained with empirical installations must serve to establish design principles as well as guide in effective regulation.†

D. Light Barriers — Ultra-violet screens or barriers constitute another special application. The air of cubicles‡ separated from the surrounding air of a ward by ultra-violet light screens can be tested either by placing the infector within and the infectee without (representing the protection offered the surrounding ward from a person ill within the cubicle), or by placing the infector without the cubicle and the infectee within (representing the protection offered a person within the cubicle from the surrounding ward). In each instance the bacterial tightness of the light-enclosed space is determined by the method of equilibrium.

In an isolation hospital, where a light barrier is thrown across a corridor to separate two contagious diseases,** the efficiency or bactericidal power of this barrier may be determined directly under the actual ventilating conditions in the corridor. The infector is placed on one side of the barrier and the infectee on the other, samples being taken with the lights on and off. The infector and infectee are then reversed and the test duplicated. Tests made by the method

* Studies on air disinfection are being conducted at the Laboratory of Sanitary Ventilation, Department of Bacteriology, University of Pennsylvania Medical School.

† Such experimental installations are now being tested at the Children's Hospital, Philadelphia, Pa.; the Germantown Friends' School, Germantown, Pa.; and the Marlboro State Hospital, Marlboro, N. J.

‡ Tests are now being conducted in the Laboratory of Air-borne Infection at the Henry Phipps Institute, Philadelphia, upon cubicle design, in collaboration with C. A. Erikson, of the firm of Schmidt, Garden & Erikson, consulting architect for the Cradle Society, Evanston, Ill.

** Dr. Charles F. McKhann first applied this principle to a corridor in the Isolation Unit of the Children's Hospital, Boston, Mass., and he has observed the results for about 1 year.

of equilibrium have shown that light screens can be made practically impervious to bacteria suspended in droplet nuclei and carried by ordinary ventilating currents.

SUMMARY

These examples serve to illustrate the manner in which the essential technic can be adapted to special problems. In each instance the measure of equivalent ventilation between any two points can be expressed in terms of the proportional pure air replacement throughout the whole room which would bring about the same reduction in the infection transferred from one to the other point.

CONCLUSIONS

In attempting to define bacterial ventilation in specific terms, the engineer is entitled to assume that the value of C, as indicative of the number of persons per given volume of air space represents a degree of potential infection, and to regard the value of K as indicative of the rate of reduction in this potential hazard resulting from the instruments of ventilation, and the ratio C/K an index of the relative hazard in one room as compared with another. Whether or not such an index can be correlated with epidemiological experience remains a major problem of sanitary science. Installations of ultra-violet lamps have been set up under competent and rigid medical control in order to determine the value of such measures under specific conditions, and until such conclusions are available to the engineer, he can only be guided by the bacteriological evidence. When indices of sanitary ventilation are correlated with the epidemiological data on a sufficiently large scale, the results should guide the engineer to the proper design of ventilating instruments. This may lead to a realization of our present hope that if the sanitary quality of air is controlled, reduction of respiratory disease will be accomplished.

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10. The technic of counting and recording colonies will be described in a forthcoming paper.

Basic Principles of Healthful Housing*

Preliminary Report

COMMITTEE ON THE HYGIENE OF HOUSING

AMERICAN PUBLIC HEALTH ASSOCIATION

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* This Report has not been approved as a standard publication by the American Public Health Association's Committee on Research and Standards but has been endorsed by that Committee for release so that it may be made available for study.

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INTRODUCTORY STATEMENT

SHELTER is one of the three fundamental needs of human existence. No housing program can be sound unless the shelter it provides is healthful. It was this latter consideration which led the American Public Health Association to organize a Committee on the Hygiene of Housing, to serve also as the organ of coöperation for the United States with the Housing Commission of the Health Organization of the League of Nations.

In beginning the work of this committee it has seemed essential to formulate the basic health needs which housing should subserve. This report is a preliminary attempt at such a formulation.

This report consists of 30 basic Principles, with Specific Requirements and suggested Methods of Attainment for each. The Principles and Specific Requirements are believed to be fundamental minima required for the promotion of physical, mental, and social health, essential in low cost as well as high cost housing, on the farm as well as in the city tenement. Under Methods of Attainment are suggested the more important means by which these objectives can be achieved, without excluding alternative means of attaining the same ends, and without attempting exhaustive treatment of the many technical points which are covered elsewhere in the literature of housing and construction methods.

In view of the present status of the housing program in the United States, particular emphasis has been placed, in drafting these Methods of Attainment, on the needs of new urban construction. The Principles and Specific Requirements, however, are equally valid as a guide for new rural construction or for the appraisal of older housing whether rural or urban, inasmuch as they are based on fundamental biological requirements.

Many of the objectives stated involve problems of management as well as of planning and construction. This must be the case if we are concerned with results achieved, and not merely with requirements on paper. Under the hopeful policy envisaged by the new public housing program—that of continuing management responsibility by local housing authorities—it should be possible to approve given types of housing facilities only for stated conditions of use and occupancy, just as elevators have long been licensed to carry only a certain number of persons, or warehouses a given floor-load.

The report here presented is a preliminary one. In the text are noted points which require further investigation. The committee is conducting research on certain of these points and will follow the findings of other agencies in the field, toward the end that the present report may be revised and amplified in the light of accumulating knowledge.

C.-E. A. WINSLOW, DR.P.H., *Chairman,*
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Committee on the Hygiene of Housing

SECTION A

FUNDAMENTAL PHYSIOLOGICAL NEEDS

*Principle 1. **Maintenance of a thermal environment which will avoid undue heat loss from the human body***

a. *Specific **Requirements***—The chief variables controlling heat loss from the human body in a dwelling (since neither air movement nor humidity is likely to be considerable) are air temperature and the mean radiant temperature of surrounding surfaces (walls, windows, radiators, human bodies, open fires). The combined effect of air temperature and mean radiant (or wall) temperature is defined as "operative temperature." For ordinary dwelling conditions, operative temperature may be taken as approximately the mean between air temperature and wall temperature. For the normally vigorous person, normally clothed, and at rest, an operative temperature of 65° F. is the minimum. In all regularly occupied rooms this temperature should be provided at knee-height, 18 inches, in order to prevent chilling of the legs and feet. Air temperature may be increased or decreased in order to compensate for deviations of mean radiant temperature above or below air temperature.

In rooms occupied by persons of subnormal vitality, operative temperatures must be higher than 65° F. Since dwellings are designed for occupancy by old people and children, the heating system should be able to provide an operative temperature of 70° F. at knee-height under ordinary winter conditions. Such a temperature is, however, unduly high for the normal adult and should not ordinarily be maintained.

Considerable vertical differentials of air temperatures are highly undesirable, since they involve waste of fuel (from increased heat loss through the upper areas of the room), and since they not only produce local chilling of the lower extremities, but also increase convection currents. From this standpoint radiant heating has special advantages, since it maintains a very low floor-to-ceiling differential. With ideal radiant heating, knee-height temperatures and 5 foot temperatures would be almost identical. With ordinary free-standing radiators a knee-height temperature of 70° F. would ordinarily imply a 5 foot temperature of 76° and a ceiling temperature of 80° F.

b. *Methods of Attainment*—The practical measures to be taken in housing design to meet these needs must, of course, depend upon climate, but it should be possible to reach the limiting temperature of 70° F. at knee-height under ordinary minimum winter conditions for the locality concerned. The usual figure for outside temperature taken by engineers as a basis for their computations is 15° F. above the lowest recorded temperature for a 10 year period.

The heating equipment provided will also, of course, be closely related to the insulation of the building. Superior types of construction, weather-stripping and the use of double windows, and the use of insulating materials in ceilings and walls may, in cold climates, reduce heating costs by 50 per cent or more. Such insulating capacity should, therefore, be provided as is justified by fuel economy balanced against ad-

ditional construction costs. The balancing of these factors is a problem deserving special study.

For low-rent housing in one- or two-story dwellings, the circulating heater type of stove will generally prove the most economical heating equipment. For apartments, and perhaps for large groups of one- and two-family houses, steam heat from a central plant should prove equally economical. Central heating cannot wisely be replaced by stoves in the multi-story dwelling because of fire hazard and the problems of fuel storage and ash disposal.

For more expensive installations, hot water heating has certain advantages. Indirect heating by hot air may also be employed. Where indirect heating involves considerable air change, permissible lower limits of temperature may have to be raised (to balance increased rates of convection loss from the body).

The possibilities of low temperature radiant heating by steam or hot water or, where power rates are low, by electricity, should be given careful consideration.

Flooring materials of high heat conducting value should be avoided, particularly where children may play upon the floor. Loss of body heat by radiation to windows may be controlled by curtains. Excessive dampness combined with low temperature will increase heat loss from the body and may cause chilling, but this condition is not common in the United States.

It should be particularly emphasized that bedrooms need not always be maintained at 65° F. when unoccupied, or when occupied for sleeping.

If intermittent radiant heating is available the bathroom may also be maintained at a lower temperature. Additional local heating units, on the other hand, may be necessary in rooms occupied by persons of subnormal vitality.

Principle 2. Maintenance of a thermal environment which will permit adequate heat loss from the human body

a. *Specific Requirements*—The factors involved here are, again, air temperature, mean radiant temperature of the surrounding surfaces, relative humidity, and air movement. In cold weather, air movement and relative humidity inside the dwelling will normally be low, and the determining factor will be operative temperature, which should not exceed 75° F. within the zone of occupancy. In warm weather, humidity will decrease the limit of tolerance, and air movement will increase it. The human body is of course acclimated to higher temperatures in summer than in winter.

It is particularly important that cool moving air be made available in sleeping-rooms, since the impact of cool air is of great value in promoting healthful sleep.

b. *Methods of Attainment*—In the winter season, it should be possible to prevent overheating by proper manipulation of heat sources with a minimum use of windows. In the case of steam heated dwellings, such control is frequently difficult; both effective operation of central heating plants and a maximum of individual control of heat supply to each room are essential for satisfactory results.

In summer, air cooling and air dehumidification are valuable adjuncts to comfort, but are beyond the present economic limits of the low-rent dwelling. In the free-standing house, the installation of an exhaust fan at the top of the house to draw in cool night air through windows is also an extremely helpful, but somewhat costly procedure. In the low-rent home we must insist on through- or cross-ventilation, and it would seem not unreasonable to include in the equipment of such a home at least one electric fan

for cooling, in regions where summer heat is considerable.

Both warming in winter and cooling in summer are materially aided by suitable orientation of the dwelling as discussed in a subsequent paragraph.

Principle 3. Provision of an atmosphere of reasonable chemical purity

a. *Specific Requirements*—The important atmospheric impurities present in the home under ordinary conditions are those contributed by cooking, by various heat sources, and those derived from the human body. (Hazards from heating sources and those associated with special toxic gases will be considered in a later section.)

The odors given off from the body have been proved to exert a definitely harmful influence upon appetite and therefore upon health. With persons of reasonable cleanliness the dilution of these odors will require an air change of 10 cu. ft. per person per minute.

b. *Methods of Attainment*—Such an air change as this, with any ordinary type of construction, will be automatically attained in cold weather by normal leakage through walls and ceilings of ordinary porosity and around doors and windows, provided the cubic space per occupant is 400 cu. ft. in any occupied room, and that the normal ratio of fenestration is supplied. The necessary air change can be secured in summer by the opening of windows. Since this minimum of 400 cu. ft. is demanded by other fundamental needs to be discussed in later paragraphs, no other provision for air change need ordinarily be made in the low-rent dwelling. If the other fundamental needs could be met, and if dependable artificial ventilation were provided, a lesser air space might be permissible.

It should be noted that this standard of 400 cu. ft. applies to any occupied room. Where separate rooms are used for living and sleeping, the total for the living portions of the dwelling must be 800 cu. ft. per person. Where the same room is used for both living and sleeping, the value should be increased to 500 cu. ft. to allow for necessary furniture.

Ceiling height may, in general, be determined by cubic space requirements and by necessary window heights.

Principle 4. Provision of adequate daylight illumination and avoidance of undue daylight glare

a. *Specific Requirements*—In order to avoid danger of eye strain and facilitate cleanliness, the minimum light value available for any occupied space relying upon natural illumination should be 6 foot candles, on a horizontal plane 30 in. above the floor.

b. *Methods of Attainment*—With unobstructed exposure to the sky, the minimum illumination defined above will be obtained in clear weather and up to a reasonable time before sunset (in the latitude of Washington, D. C.) with an area of window glass equal to 15 per cent of the floor space of a room (provided that walls and ceiling are light in color). In other latitudes the necessary window area may be greater or less. Findings of the U. S. Public Health Service on this point are being assembled by the committee.

With buildings so closely grouped as materially to obstruct sky shine, daylight illumination will be seriously hampered. This subject requires further study. At present, it seems reasonable to require at least a 45° sky angle at the lowest window sill, which implies that the width of intervening street and court space should approximate at least the height of opposite buildings. Porches should not be so placed as to obstruct the entrance of light.

All rooms, including bathrooms, should have at least one window open-

ing to the outer air. Daylight illumination should be provided for public halls and stairs, except perhaps in elevator apartments with adequate janitor service.

It is of advantage to have the tops of windows as near to the ceiling as possible, to give the greatest sky angle in all parts of the room and thus to secure the greatest lighting effectiveness. Inside walls of a good reflecting value are essential factors in obtaining the desired result. Glossy paint should be avoided on account of glare; ceilings should be matt white.

For control of glare, suitable window shades are essential; those of the Venetian blind type, although costly, are desirable, since they protect from glare while reflecting light to the inner part of the room. Windows extending below 30 in. from the floor tend to cause glare and obstruct furniture placement without materially increasing the general illumination.

It should be noted that good natural lighting is often interfered with by internal obstructions, such as draperies and furniture. It would be of advantage, where available light is near the desirable limit, so to place curtain rods that draperies may be hung adjacent to, rather than over, the windows.

Principle 5. Provision for admission of direct sunlight

a. *Specific Requirements*—No definite quantitative limits can be set; but it is clearly desirable for all dwellings, and essential for those occupied by persons who are housebound, that direct sunlight should enter at some places and hours, even in winter. Sunlight, particularly through its ultraviolet components, provides valuable physiological stimulation.

b. *Methods of Attainment* — Insolation in a given room depends on sky angle as related to that area of the sky occupied by the sun's orbit at a given season. It will be materially influenced by orientation, by buildings or projections so located as to cut off morning and evening sun, and by the placement of windows. In the northern latitudes of the United States, a generally southerly orientation of rooms for daytime occupancy is most desirable since it gives a maximum of sunlight in winter.

Under the meteorological conditions which characterize New York City, an orientation of living-rooms 25° west of south has been found to yield a maximum of effective sunlight in winter and a minimum in summer. This relation is important in temperature control and heating economy as well as in penetration of sunlight; it should be studied for other areas.

Casement windows, because of their larger clear opening, are more desirable than double-hung windows from the standpoint of admitting the ultraviolet rays of sunlight; but they permit undue heat loss if not tightly fitted.

Principle 6. Provision of adequate artificial illumination and avoidance of glare

a. *Specific Requirements* — Artificial illumination of 6 foot candles should be generally available in all occupied rooms, with at least 10 foot candles at certain points for reading, study, or sewing. Illumination of at least 1 foot candle should be provided on stairs and in passageways to minimize danger of accidents. Glare effects should be avoided in the design and location of fixtures.

b. *Methods of Attainment* — The maintenance of the illumination specified above, and the avoidance of accident hazards due to oil lamps, can only be attained by the use of electricity. Electric lighting should be considered a minimum requirement for the healthful American home.

There should preferably be a central outlet in the ceiling of each room, with two convenience outlets in the living-room and one in each of the other rooms. In the kitchen, shadows on the sink and work table should be avoided, if necessary by installing a second fixture. In the bathroom the central fixture may be replaced by lighting adjacent to the mirror.

Sleeping-rooms should be protected from artificial external light sources such as street lights and electric signs.

Principle 7. Protection against excessive noise

a. *Specific Requirements*—Excessive noise, a factor much neglected in the United States, is of serious moment in so far as it causes nerve strain and interferes with sleep and other physiological processes. It should be possible to exclude noises from outside the dwelling unit to such a degree that within that unit the noise level shall not exceed 50 decibels; and a level as low as 30 decibels should be attainable in rooms used for study or sleeping. These standards are based on European practice and call for further examination under American conditions (including the prevalence of radios and automobiles) and under American habituations.

b. *Methods of Attainment*—The solution of this problem depends, first of all, on the control of external sources of noise, which involves the avoidance of dwelling sites with exposure to special sources of noise (factories, highways, railroads, athletic fields, and the like), and the control of motor horns and other sources of vehicular noise.

With a given environment it calls for such construction as will reduce the noise from external sources to the levels stated above.

For control of noises transmitted by air within a building, party walls should effect a reduction of 50 decibels (approximately the result produced by an 8 inch brick wall). For control of structure-borne noises knowledge is inadequate, but the Sub-Committee on Noise of the Housing Commission of the League of Nations recommends that floors should be designed with a noise-insulating value at least 15 decibels superior to that of a bare concrete floor. (The concrete floor would probably insulate adequately against air-borne sounds.)

Further study on these points is being made by this committee.

Principle 8. Provision of adequate space for exercise and for the play of children

a. *Specific Requirements* — Opportunities for physical exercise and recreation, for both children and adults, are essential to a sense of organic well-being and the enjoyment of mental health. While these ends may be considered as primarily psychological in nature, they are attained by physiological processes and may therefore be considered under the present category. The attainment of the purposes indicated calls for adequate floor space within the dwelling and, under urban conditions, for outside space which has been defined in terms of from 3 to 5 acres of park and play spaces per 1,000 persons, in addition to more distant regional park areas. The National Park Service suggests 10 acres (including parks adjoining a city).

b. *Methods of Attainment*—For city dwellers it has been suggested that the recreation area should include a playground within such distance as to be practically accessible, and an athletic field within half a mile of each home for the use of adolescents. It is desirable that play space for young children (separated from adolescents) should be available within sight of the dwelling.

This subject of standards for recrea-

tion space is receiving further study by this committee.

It should be emphasized that provision of recreation facilities is by no means necessarily a function of housing authorities, except in large urban projects where community morale may affect the success of the project. Such facilities are logically chargeable to the community as a whole, rather than to a specific housing project. Yet it is clearly the responsibility of the housing authorities to be certain that such facilities are, or will be, available before approving a housing scheme. In large urban developments the management may make provision for trained leaders of club and recreational activities if such service is not otherwise available.

SECTION B

FUNDAMENTAL PSYCHOLOGICAL NEEDS

Principle 9. Provision of adequate privacy for the individual

a. *Specific Requirements* — The essential concept of a home involves the possibility of that isolation from the world which every human being sometimes craves and needs. Especially in cities, the home is a needed refuge from the noise and tension of the street and marketplace. The same principle applies within the home itself. When the dwelling unit is crowded, frequent personal contacts may be the cause of nervous irritation, as detrimental to mental health as is the more obvious influence of contact infection upon physical health. "A room of one's own" is the ideal in this respect; but we can at least insist on a room shared with not more than one other person as an essential minimum. Such a room should be occupied only by persons of the same sex except for married couples and young children. The age at which separation of sexes should occur is fixed by law in England at 10 years, but some American authorities would place the figure 2 years lower. Sleeping-rooms of children above the age of 2 years, according to psychiatric opinion, should be separate from those of parents.

Furthermore, fundamental habits of decency demand that toilets, bathrooms, and bedrooms should be accessible from halls or living-rooms without passing through other bedrooms or bathrooms.

Dwellings should be so spaced on their sites, and their windows so located, as to limit direct vision from one dwelling into the bedrooms of another.

b. *Methods of Attainment*—The objectives stated can be attained by various types of design, but they imply in practice at least the standards enforced under the current English legislation on overcrowding. Under this legislation, not more than 2 persons may occupy a sleeping-room. Two rooms are required for 3 persons, 3 rooms for 5 persons, 4 rooms for 7½ persons, and so on. Bathrooms and sculleries are not counted as rooms. For the purpose of governing occupancy, infants under 1 year of age are not counted, and children between 1 year and 10 years are counted as half-persons.

It is desirable to provide sleeping space apart from the living-room, but when this cannot be done, the living-room must be provided with reasonable privacy, as outlined above.

Overcrowding cannot be prevented either by proper physical planning alone or by good planning plus care in the initial selection of tenants. It is also necessary that continuing super-

vision be exercised and that adjustments to changing family needs be made by management authorities. Limitation of boarders, control of subleasing, intelligent adjustment of rent schedules to family size and income, sympathetic handling of transfers or other problems due to changing family size or income are all involved in maintaining desirable conditions of privacy.

Principle 10. Provision of opportunities for normal family life

a. *Specific Requirements*—Privacy is one element in normal family life; but sociability is another, which is psychologically and socially quite as important. Opportunity for adolescent youth to meet persons of the opposite sex under wholesome conditions should be provided. To meet these needs a common living-room which can be occupied by all members of the family, plus reasonable space elsewhere for withdrawal during periods of entertainment, would seem essential. It is important for the establishment of friendships and the striking of family roots in the chosen community that continuous residence in that community should be possible through all the normal changes in family size and make-up; such continuity is intimately related to the provision of living-units adapted to families of various sizes. Furthermore, the entertainment and overnight accommodation of guests and relatives, which is as fundamental a family need in modern apartment life as in the tents of the Arabs, should be given consideration.

b. *Methods of Attainment*—A living-room providing 400 cu. ft. of space for each member of the family would seem a desirable ideal. In multiple-dwellings the needs for extra-familial social life can be met to a considerable degree by club-rooms and common rooms for a group of dwellings.

The continuance of the family in the community of its choice will be greatly fostered by the provision in every housing project of living units sufficiently varied in size to provide accommodations during the whole cycle of family development, from the phase of child rearing and gradually increasing family size, on to the period when parents whose grown children have set up their own homes will normally live by themselves. Related problems which must be solved by the planner are those of the non-typical household, such as the group of employed adults unrelated to one another and possibly desiring more than normal privacy, or the normal family plus grandparents or with an invalid member—in which cases unusual quiet or special access to the sun may be required. It is obvious that no advance provision can be made for each of these contingencies exactly as it will occur; the plea, however, can be made that the designers of housing visualize as fully as they can the varied uses of family life to which their buildings will be put, and that they provide all reasonable variety in plan arrangements. The housing needs of a population are not met by devising standard 3 and 4 and 6 room unit plans and repeating them endlessly without variation simply because they are efficient users of space and have an economical relation to plumbing stacks and stairs.

In this connection it is worthy of note that a responsible group of housing managers have recently cited as their greatest difficulty that of reconciling the living units they have to offer with the living needs of the families who apply to them for space. The conclusion seems warranted that these fundamental needs of family life have been seriously neglected in much recent American housing.

The temporary accommodation of guests and relatives is a difficult problem in the compact type of living unit

which characterizes most large-scale housing developments. In at least one recent American project it has been necessary to solve this problem by the conversion of an ordinary dwelling into semi-hotel facilities for week-end visitors and other temporary residents. It should be possible in certain large-scale housing projects to experiment with the provision of a few guest rooms serviced by the central management, and to determine in practice both the benefits and the problems attendant on providing such overflow facilities for normal family life.

Principle 11. Provision of opportunities for normal community life

a. *Specific Requirements* — In order to promote the psychological and social values which result from participation in normal community life, the home should be located in a community which contains or has easy access to the basic institutions of culture and commerce, and from which the major centers of employment can be reached without undue expense or loss of time and energy in travel.

Among the community facilities which should be made conveniently accessible to the home, the most important are: schools, churches, facilities for necessary local shopping and entertainment, libraries, and medical service. (Facilities for physical recreation have been discussed above.)

A vital community life should be fostered in housing developments by supplying, as a part of any new physical plant, the basic neighborhood facilities which are lacking, and by management policies which will encourage spontaneous community organization.

b. *Methods of Attainment* — This principle involves town and community planning and housing management as well as housing design in its narrower sense. It is, however, directly related to the choice of sites for housing projects and the plans for their subsequent development.

The school and the workplace are vital elements in the community background of the home; they should be within reach without undue expenditure of time, energy, or money. Location of the school beyond a walking distance for the child may restrict his participation in normal and desirable extra-curricular activities. If adults are required to spend more than an hour a day in going to and from work, they may be subjected to considerable nervous and physical strain, and the time and energy available to them for recreation or participation in neighborhood activities may be materially curtailed. Suitability of location is obviously related to transportation facilities and to the family carfare budget, so that no definite standards can be set; yet the point is often of controlling importance in the selection of sites for housing development.

The provision, as an integral part of new housing developments, of community work-shops and of health centers or clinics which function under the existing local public health service appears to offer sound possibilities which have been little explored.

Although the attitudes of local governments and housing management toward the autonomous community life of housing projects should be sympathetic, great care should be taken to avoid freezing the lines of social cleavage that may so easily form around the project dwellers as a privileged group in the community. Management authorities should be alert both to encourage natural neighborhood groupings and to take advantage of normal social services existing in the area.

It should be noted that many recent housing projects not only meet the basic needs cited above but provide important opportunities for economic

coöperation and a sense of community responsibility far greater than is ordinarily attained in either urban or rural life. It seems possible that in this regard our housing program is making a substantial contribution to the most vital of all American political needs—the consciousness of and participation in the common tasks of community living.

Principle 12. Provision of facilities which make possible the performance of the tasks of the household without undue physical and mental fatigue

a. *Specific Requirements*—This principle involves avoidance both of physiological and psychological factors contributing to fatigue. The home is not merely a dwelling; for the housewife it is a work-place as well. Recent studies show that some 60 person-hours of home-making activities per week are required in the average home. The principles of sound industrial hygiene demand directness of circulation and good facilities for storage, cooking, laundering, and refuse disposal. Cleansing, which is also important in this connection, is discussed in a subsequent paragraph.

b. *Methods of Attainment*—In order to minimize fatigue from needless walking in the performance of household tasks, halls and doors should be so located that internal circulation is direct and access to outside entrances (both front and rear) convenient, especially from the kitchen. Door swings should be so arranged as to minimize interference with other doors, with furniture placement, or with circulation. Easy access to the ground is important to the housewife when she has packages to carry in, the baby to be sunned, or washing to be hung out. Walk-up apartments should therefore be limited in height to 3 stories.

So far as storage is concerned, home economics authorities emphasize the need for a closet or wardrobe at least 22 in. deep and 3 ft. or more in width for each bedroom, cupboard space in the kitchen (protected against dust and flies), provision for storing brooms and ironing-boards, and additional general storage space for miscellaneous objects other than personal clothing and kitchen equipment. In multiple-dwellings a common storage space for baby carriages and bicycles should be provided, accessible by a ramp if not at grade.

From the standpoint of equipment, the kitchen should be provided with a suitable range. In urban areas a gas or electric range is desirable, which must meet the standards of safety discussed in a succeeding paragraph.

There should be a kitchen sink with a draining surface at the left, with the bottom of the sink set at a height of approximately 32 in., to avoid the strain involved in a low sink. Other work surfaces should not be higher than 34 in. above the floor.

Where laundering is done on the premises, a laundry tub and available drying facilities are essential. In multiple-dwellings, common laundries should be provided only if it is probable that they will be used by the prospective occupants.

The convenient disposal of garbage and refuse is important for many reasons, including maintenance of self-respect, control of flies, rats, and other vermin which may spread disease, and avoidance of fire hazards. In congested areas, a sanitary non-absorptive receptacle for garbage is an essential part of house equipment, and in multiple-dwellings special chutes discharging into incinerators have been found desirable. The best type of outside garbage receptacle is one that is set below the ground surface and protected from access of animals. A separate receptacle for ashes and rubbish should be provided where necessary, protected

against dissemination of its contents by the wind.

Principle 13. Provision of facilities for maintenance of cleanliness of the dwelling and of the person

a. *Specific Requirements* — Cleanliness of the dwelling depends in part on such construction as will facilitate cleansing; both dwelling cleanliness and personal cleanliness demand an ample supply of water (20 gallons per capita per day is a minimum for household use), with facilities for heating water. The ends in view are justified in part by the rôle of clean hands in preventing the spread of germ diseases, but on an even wider base they may be considered essential to self-respect from a psychological standpoint.

b. *Methods of Attainment*—To facilitate household cleansing, interior surfaces should be as nearly impervious, and joints between surfaces as tight, as is reasonably practical. Design should minimize dust-catching angles and pockets. Surfaces should be readily washable.

A safe water supply, adequate in quantity and under pressure, should be available within the dwelling. Where water has to be brought in by hand it will not be used in amounts necessary for cleanliness. Anything short of a pressure supply is a sub-standard compromise.

A bathtub or shower should be provided for each family where a pressure water supply is available, in addition to a wash basin.

Finally, at least a minimum supply of hot water is an essential of sanitary decency. This may be provided in the very low-cost rural home by heating water on the stove, but a hot-water heater is a basic element in really satisfactory housing.

Principle 14. Provision of possibilities for reasonable esthetic satisfaction in the home and its surroundings

a. *Specific Requirements*—It is obvious that matters of taste cannot be crystallized in quantitative terms, but it may properly be emphasized that the desire for beauty is a fundamental psychological urge whose satisfaction, in some degree at least, is essential to healthy living in the full sense of the term.

b. *Methods of Attainment*—The attainment of the ends suggested involves the application of taste and skill in community planning, in landscape design, in architecture, and in decoration, with due reference to the fact that variety is as essential as harmony in such a field. The difference in construction costs between an ugly and a beautiful building need not be appreciable, and the extra cost of brains used in planning is, in this case, relatively a very minor factor.

Principle 15. Concordance with prevailing social standards of the local community

a. *Specific Requirements* — Requirements here are obviously purely relative. It should, however, be pointed out that the sense of inferiority developed in a home notably below the standard of friends and neighbors may, and often does, produce emotional reactions, particularly in children, which are fundamentally incompatible with mental health. The public has developed a keen sensitiveness to the dangers of communicable disease, but still fails to realize the importance of emotional hazards. Under modern conditions of American living, a sense of inferiority due to living in a substandard home may often be a more serious health menace than any insanitary condition associated with housing.

b. *Methods of Attainment* — These again are relative and cannot be stated in any general terms. It is important that housing plans should take into account local social and racial stand-

ards which may profoundly modify the applications of the principle under discussion.

Social standards of a given area should be protected by proper zoning ordinances.

SECTION C

PROTECTION AGAINST CONTAGION

Principle 16. Provision of a water supply of safe sanitary quality, available to the dwelling

a. *Specific Requirements*—The water supply system should be so located, constructed, and operated that the water supply will not be a means of conveying disease; and the water should be devoid of objectionable chemical and physical characteristics. In some localities, it may be impossible to obtain water that meets all of these requirements, but in any case only a water that is safe from a public health point of view should be used. The standards established by the U. S. Public Health Service for drinking water served on inter-state trains may be used in determining the safety of the supply.

b. *Methods of Attainment* — The ideal is, of course, a communal supply whose sanitary quality is approved by health authorities. The availability of such a supply should be an important factor in selecting sites for housing projects.

Where individual supplies are the only ones obtainable, a properly protected spring or well is ordinarily the best solution of the problem. Surface supplies cannot practically be made safe for the individual household. The conditions necessary to insure a sanitary well supply are outlined in the Progress Report of the Committee on Ground Water Supplies of the Conference of State Sanitary Engineers for 1936, published as Supplement No. 124 of *Public Health Reports* (U. S. Public Health Service).

Principle 17. Protection of the water supply system against pollution within the dwelling

a. *Specific Requirements*—This principle requires construction of house plumbing in such a way that the water cannot be contaminated by cross-connections, by siphonage from bowls, tubs or toilets, or by drip into water reservoirs.

b. *Methods of Attainment* — Direct cross-connections or contamination of water reservoirs can be avoided by proper initial construction and by routine inspection of large installations by health departments to check on alterations. To avoid one common and possibly serious source of contamination—back-siphonage of polluted water into the supply—all fixture inlets which are directly connected to the supply system should be at a sufficient distance above the possible water level attained in the fixture itself to prevent contact. Numerous types of lavatories, drinking fountains, and other fixtures now in common use (and even some of those installed in recent public housing projects) violate this principle, although safe equipment is on the market. While it is unreasonable to demand remodeling of existing fixtures, this problem should receive attention in all future construction or replacement.

Principle 18. Provision of toilet facilities of such a character as to minimize the danger of transmitting disease

a. *Specific Requirements*—This principle involves, on the one hand, pre-

vention of spread of infection by flies or other insects and, on the other, reduction of the likelihood of transmitting intestinal or venereal diseases by contact.

b. *Methods of Attainment* — The ideal method of controlling access of insects to fecal discharges is the water-carriage system of sewerage, and housing projects should—so far as is possible—be located where such facilities are available. For the isolated home where water carriage is impossible, a sanitary privy so constructed as to protect fecal deposits from access of flies, and so located as not to endanger a water supply, is obviously a minimum essential. The type of privy recommended by the U. S. Public Health Service may be used where this method of disposal is unavoidable.

A separate toilet for each family would seem to be essential to insure responsibility for cleanliness as well as to promote decency.

Toilets should be located at a sufficient elevation above the sewer level to avoid back-flooding.

From the standpoint of avoiding venereal disease transmission, the toilet seat should be of an open-front type.

To avoid dangers of infection from contact with fecal matter, the walls and floor of the toilet compartment should be of material which is as nearly impervious as possible. Good lighting of the compartment is essential, since visibility is a major factor in stimulating habits of personal cleanliness. Artificial lighting alone is unsatisfactory on account of maintenance problems: a window opening to the outer air should be considered a minimum essential for all new construction. If the toilet compartment has a window opening to the outer air, no special provision for ventilation is necessary. Furthermore, many plumbing codes—based on the "sewer-gas" fetish—require quite unnecessary construction costs (as for back-venting). The *Recommended Minimum Requirements for Plumbing* published by the National Bureau of Standards in 1931 should be used for the revision of such codes.

Principle 19. Protection against sewage contamination of the interior surfaces of the dwelling

a. *Specific Requirements*—This principle involves tightness of the house drainage system and construction of the main house drain and the external sewerage system so as to avoid back-flooding.

b. *Methods of Attainment*—Leaks of sewage on cellar floors, work surfaces, or elsewhere can be avoided by tightness of construction. To prevent the backing up of sewage into the dwelling, care should be exercised in selecting sites where adequate sewage disposal facilities are, or can be provided. Preference should be given to locations where separate systems of sanitary and storm sewers are available and to locations where ample fall can be obtained between the basement floor of the dwelling and the street sewer. Where such separate systems are in use, storm water from the roof and surface drainage should be conducted to the storm water sewer, and domestic sewage and basement drainage only allowed to enter the house sewer. Where necessary, the hazard of back-flooding the basement may be minimized by (1) installing an automatic back-water valve and a gate valve on the branch drain to which basement plumbing fixtures are connected, or (2) connecting the outlets of basement plumbing to a sump equipped with a suitable automatic pump or ejector which is arranged to discharge into the building sewer.

In the case of an isolated dwelling which is provided with an individual sewage disposal system, only domestic sewage and basement drainage should enter the system.

Principle 20. Avoidance of insanitary conditions in the vicinity of the dwelling

a. *Specific Requirements* — Where a cesspool or local sewage disposal plant is maintained, it must be so designed and operated as to avoid exposure of sewage which will permit transmission of disease by contact, by flies, or by pollution of wells; and the neighborhood must be kept free from accumulations of refuse which will afford food or harborage to flies or rats, and from standing water in which mosquitoes may breed.

b. *Methods of Attainment* — Where a cesspool or a local sewage disposal system is used, certain principles concerning the location and construction of such installations should be observed (such as location and depth of sewer; pipe sizes, materials, and jointing; and location, capacity, and covering of tanks). State health departments usually provide specifications in regard to these points. This committee is preparing suggested minimum standards for the location and design of sewage disposal systems for isolated dwellings where a settling tank and soil absorption system is used. The possibility of contaminating wells through the soil should be avoided in locating privies and sewage disposal systems. (Particularly in clay or limestone regions, available soil absorption capacity in relation to population should be considered in choosing a housing site.)

Accumulations of organic refuse which will breed flies should be avoided by provision of facilities for the removal and disposal of such refuse. Accumulations of rubbish, piles of lumber, etc., may provide harborage for rats and should not be permitted.

Stagnant water should, where possible, be removed by drainage or filling; bodies of water which cannot be removed and which are of a character to permit mosquito breeding should be treated by appropriate anti-larval methods.

Principle 21. Exclusion of vermin which may play a part in the transmission of disease

a. *Specific Requirements*—This principle is concerned primarily with protection against mosquitoes, flies, and rats.

b. *Methods of Attainment* — Where mosquitoes and flies are present, all doors, windows, and other openings should be screened with No. 16 wire mesh. Screen doors should always open outward and should be self-closing. It is preferable to screen an entire window rather than only a part of it.

Where the rat problem is appreciable, care should be taken to close effectively all openings through foundations and floors, such as openings around pipes and cracked walls. Such openings should be closed with metal sheeting or concrete or other suitable rat-proofing material, such as asbestos board. Basement windows should be covered with strong, durable screening, such as standard 8-mesh galvanized hardware cloth. Ventilators and sewer openings should be provided with gratings. Exterior doors should be self-closing. The building foundation should be of concrete or masonry (or otherwise rendered rat-proof) and should extend (aside from frost or structural load considerations) from a point at least 2 ft. below ground to a point at least 2 ft. above ground. In case the floor is closer to the ground than 2 ft., the space in the walls between the studding should be filled with concrete, or other material indestructible by rats, up to a point 2 ft. above ground level.

Where the population to be housed is likely to be infested with vermin, provision may have to be made for fumigating clothing and furniture before occupancy is permitted.

Principle 22. Provision of facilities for keeping milk and food undecomposed

a. *Specific Requirements* — Various bacteria which cause food poisoning may propagate in foods which are not adequately cooled. Every home should have facilities for holding perishable foods at 50° F. or below.

b. *Methods of Attainment*—Either a mechanical refrigerator or a suitably constructed ice refrigerator should be considered an essential element in home equipment. Even in northern climates this will be necessary in summer. Refrigerator sizes should be adapted to family sizes; 4 cu. ft. of food storage space is ordinarily required for a family up to 5 persons.

Principle 23. Provision of sufficient space in sleeping-rooms to minimize the danger of contact infection

a. *Specific Requirements* — Experience in barracks and institutions has shown that a distance of less than 6 ft. between the centers of adjoining cots or a space of less than 50 sq. ft. per bed may lead to the spread of communicable diseases by dissemination of mouth spray from an infected occupant. The distance of 6 ft. between the centers of adjacent army cots would imply at least a 3 ft. space between the beds themselves, which is the essential point.

b. *Methods of Attainment*—To make it possible to meet the requirements above, the sleeping-room should therefore have at least 50 sq. ft. of floor space per occupant. This space is also required for placement of ordinary bedroom furniture. Assuming the customary minimum ceiling height of about 8 ft., this requirement checks with the standard of 400 cu. ft. per person suggested on other grounds.

Double-deck beds, sometimes advocated as a space saving device, are undesirable as favoring mouth spray infection.

SECTION D

PROTECTION AGAINST ACCIDENTS *

Principle 24. Erection of the dwelling with such materials and methods of construction as to minimize danger of accidents due to collapse of any part of the structure

a. *Specific Requirements*—These are being studied by the Building Code Correlating Committee of the American Standards Association, whose program includes standards for excavations and foundations, masonry work, iron and steel work, and structural loads.

b. *Methods of Attainment* — The ways in which such safety requirements can be translated into practice are obviously too complex to be cited here.

In view of current interest in the problem, a word may be said as to the structural menace of termite infestation. In zones where such infestation is serious, special provision should be made for termite control by constructing foundations of impenetrable concrete or masonry, and by removing stumps, chips, and litter from beneath the house. Adequate ventilation should be provided for the space beneath the house; vents should be screened; the clearance between the ground and woodwork should be at least 6 in. for the outside of the foundation and 18 in. inside; and for the most effective protection, termite shields of copper or other durable metal should cap the

* The importance of this problem is indicated by the fact that in 1936 home accidents in the United States caused 38,500 fatalities as compared with but 37,800 motor vehicle fatalities.

foundation wall. For complete protection, these shields should be continuous and extend entirely across the foundation wall, should project 2 in. or more on either side, and should be bent down at an angle of 45°. All posts, piers, pipes, and other structural members in contact with the ground should be shielded with projecting caps or collars. Surfaces that are difficult to inspect should be given the most thorough protection.

Principle 25. Control of conditions likely to cause fires or to promote their spread

a. *Specific Requirements* — All that can be insisted on—from the standpoint of protecting the lives of occupants—is that dwellings shall be so constructed and equipped as to minimize the probability of starting fires, and that the spread of fires shall be sufficiently retarded to permit the escape of occupants. Local building codes may require that dwellings shall not collapse for a period of several hours under fire conditions so extreme as to preclude the survival of any occupant. Such requirements, which add to the cost of building, must find their justification on other grounds than those of human safety.

b. *Methods of Attainment* — Potential sources of fire within the dwelling exist in electric installations, stoves and furnaces and their smoke-pipes, and in chimneys. Prevention of electrical fires calls for such details of construction as will control danger of crosses and the avoidance of exposed wiring subject to short-circuiting through wear. These factors are adequately dealt with by the usual local electrical codes. Stoves or furnaces should be mounted clear of combustible walls and floors, and if located near woodwork, should be insulated from it by adequate air space and by mats or screens of non-combustible material. Smoke-pipes should be securely supported, well separated from woodwork or other inflammable materials, and kept clean. Where such a pipe must pass through a combustible partition, a ventilated thimble should be used to provide an air space around the pipe. Stove-pipe openings in chimneys should be covered when not in use.

Chimneys should be so constructed and supported as to avoid danger of overheating adjacent combustible elements. Masonry chimneys should be lined with fire-clay tile, with joints staggered in relation to masonry courses. Wood beams, joists, or partition members should be placed at least 2 in. away from chimneys, with the intervening space mortar-filled or otherwise effectively insulated.

In order to prevent the spread of fire originating within the structure, safe practice demands that in multiple-dwellings (regardless of height) the following elements be of non-combustible construction: exterior walls, roofs, first-tier beams, partitions between apartments and between stair halls and apartments, and all shafts. It is hardly less desirable that all floors and floor joists also be non-combustible. Certainly all multiple-dwellings exceeding 3 stories in height should have non-combustible floors and floor joists, and all those exceeding 4 stories in height should be fire-proofed throughout. Walls and partitions may be of brick, hollow tile, reinforced concrete, or other materials which upon test show that they will resist fire or delay its spread for a sufficient time to permit the escape of occupants.

For single-family dwellings of low cost, such fire-resistive construction may not be feasbile, but fire hazards should be restricted through care in the installation of stoves, chimneys, and electric wiring as described above, through fire-stopping, and through reasonable precautions in the construc-

tion and finishing of roofs and walls.

Where framing with combustible members involves hollow wall spaces, the spread of fire can be retarded by closure of these spaces with fire-stops at the floor, wall, and roof lines. Well fitted boards can serve as temporary checks, but better results will be obtained by filling the voids with non-combustible materials for a distance of 4 in. or more above the fire-stops.

Fires are commonly spread from building to building by brands or radiant heat. Most of the non-combustible types of roofing have sufficient insulating value to prevent ignition of the boards supporting them by either of these means. The protection afforded by metal roofings can be increased by placing asbestos felt between the roofing and the boards. Wood shingles should not be used on account of their poor resistance to brands; once afire, they may themselves give off flying brands and set fire to neighboring structures. Weathered wood shingles are particularly subject to ignition by brands.

Among the common exterior wall materials, the range in fire resistance begins with board finish and runs in order through phenol plywood, stucco on wood lath, stucco on metal lath, and masonry veneer over wood frame, to load-bearing masonry walls. Well maintained paint coatings will slightly increase the fire resistance of a wood surface to exterior fire sources.

It should be a routine requirement that inflammable buildings be spaced far enough apart to prevent the spread of fire by radiant heat.

Fire-fighting provisions which are usually necessary include reasonable accessibility of each dwelling to fire-fighting vehicles and an adequate water supply for fire apparatus. The provision of chemical fire-extinguishers may be justified in the halls of multiple-dwellings.

Principle 26. Provision of adequate facilities for escape in case of fire

a. *Specific Requirements* — In every living-unit, the existence of exits which will not be cut off in case of fire should be regarded as a minimum essential; and these exits should be of such a nature that they can safely be used by women and children and at night.

b. *Methods of Attainment* — Multiple-dwellings should be provided with at least two means of exit from each living-unit. For reasons of economy in construction, exception may reasonably be made in the case of multiple-dwellings of 4 stories or less which are of fire-proof construction and provided with stairways in separate fire-proof enclosures having self-closing doors at each floor; compromises may also perhaps be made in certain cases of 2 story non-fire-proof buildings.

In multiple-dwellings, the doors of public exits should open outward.

Where local ordinances require outside fire-escapes, these should be constructed in accordance with the *Building Exits Code* of the American Standards Association. It is vital that fire-escapes should terminate on solid level ground or pavement in locations from which egress is unencumbered.

It is important to note that many types of drop ladders now permitted by local codes are so heavy and difficult to manipulate (particularly when rusted or heavily painted) that only a trained athlete can be expected to use them. The danger from such devices to a woman or child on an icy night is very serious.

Principle 27. Protection against danger of electrical shocks and burns

a. *Specific Requirements* — The requirements as to structural installations (aside from fire hazards) are two: (1) Live conductors and live parts of electric equipment should not be exposed to contact. (2) Exposed metal en-

closures should be grounded so as not to become alive from failure of insulation. Portable appliances and pendent fixtures should be so placed that a person will not simultaneously come in contact with electric fixtures and with plumbing fixtures or other grounded metal.

b. *Methods of Attainment*—In bathrooms, laundries, kitchens, or other spaces where the hands are likely to become wet, electric lights should be controlled by wall switches or pull chains containing insulating links, and any lamp sockets within reach should have non-metallic shells. Convenience outlets in such spaces should be located so as to minimize the probability of touching plumbing fixtures while using electric appliances. Convenience outlets should not be located in baseboards but high enough to be out of reach of creeping infants, which placement also brings them within more convenient access for the user. Any permanently installed electric heater should have a protective grating to prevent contact.

Principle 28. Protection against gas poisonings

a. *Specific Requirements*—The chief toxic substances likely to be associated with the dwelling are carbon monoxide from imperfect combustion in cooking or heating appliances, leaking gas from fixtures, and toxic gases from certain refrigerating devices. The control of such hazards is obviously essential.

b. *Methods of Attainment*—Any gas cooking-ovens and space heaters which involve the possibility of partial combustion must be provided with an adequate flue opening to the outer air. Chimneys, furnaces, and stovepipes should be maintained in a tight and clean condition, as should gas connections and gas heating appliances.

Where toxic gases are employed in multiple refrigerator installations, special attention should be paid to tight and durable jointing, and a warning gas should be added to odorless toxic refrigerants (in replacing routine leakage as well as in the original installation). Rooms which contain gas cooking appliances or mechanical refrigerators should not be used for sleeping.

Precautions against carbon monoxide poisoning in a domestic garage are an obvious need, but ordinarily involve no special structural provisions.

Principle 29. Protection against falls and other mechanical injuries in the home

a. *Specific Requirements* — Hazards of this type are too diverse to be catalogued, but it is clearly essential that stairs, windows, and balconies should be so constructed as to minimize danger of falls. In view of the many serious falls which occur in the bathtub, this problem should be kept in mind in planning the bathroom. Protection should also be given against injuries on outside steps and walks.

b. *Methods of Attainment*—A stairway should not be made too steep, and a proper proportion should be maintained between the dimensions of riser and tread. Satisfactory values are 7 to 7½ in. for the riser and 10 in. for the tread. In any case, these values should meet the conditions that the sum of the tread and twice the riser equals 24 to 25 inches, and that the angle of slope is between 30° and 36°. Steps of a flight should be uniform in dimensions, as any irregularity may cause tripping.

It is essential to provide every flight of stairs with a handrail. Outdoor steps especially need rails in northern latitudes, owing to ice.

Winding stairways too narrow for foothold at the rail side must be avoided, as they particularly invite falls. If a doorway is placed at the head of a flight of stairs, which practice has merit from the standpoint of

preventing the spread of fire, there should be a landing at least 30 in. wide on the stair side of the door. If this landing is omitted, the door should have a glazed window.

Low window sills (less than 30 in. from the floor) should be avoided, especially at stairway landings. If unavoidable, low windows may be provided with one or more cross-bars to prevent children from falling out. Built-in window screens have advantages, from the casualty prevention viewpoint.

Casement windows, if designed with sufficient clearance at the hinge to permit washing from the inside, will minimize dangers in window cleaning.

There should be railings or parapets around porches, balconies, accessible roofs, etc., high enough (at least 30 in.) to prevent falling off the edge. Such falls may cause serious accidents even when the distance is not more than 2 or 3 ft.

In bathrooms, especially where built-in tubs are installed below tiled walls, built-in hand-grips should be provided, sufficiently in front of the bather's position to be within convenient reach.

In the North, sloping roofs (with a pitch of perhaps from 15° to 55°) which end over steps or walks should be equipped with snow guards to prevent masses of snow from sliding onto the head of the passerby.

Adequate lighting of exterior courts, walks, and particularly of steps, is an essential safety factor.

Principle 30. Protection of the neighborhood against the hazards of automobile traffic

a. *Specific Requirements* — Attainment of this ideal must obviously be relative, and no specific standards can be set.

b. *Methods of Attainment* — Traffic regulation is an essential element in modern community planning; and it is particularly important that traffic in the vicinity of dwellings should be so organized as to minimize danger to both motorists and pedestrians (particularly children).

Residential streets should therefore be so planned as to discourage through traffic. It is often possible to do this in new housing communities by means of dead-end streets. Blind corners should be avoided by proper study of both building placement and shrubbery.

Pedestrian routes from all residential areas should be so planned that elementary schools, local shops, playgrounds, etc., may be easily reached without crossing any major traffic way except by the use of overpasses or underpasses.

Playgrounds should be effectively screened off from automobile ways.

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"STRENGTH IS INCAPABLE OF EFFORT, WEALTH USELESS AND ELOQUENCE POWERLESS IF HEALTH BE WANTING"

ON September 30, the English launched a six months campaign devoted largely to health education.[1] Beginning in October, several hundred meetings will take place throughout that country, occupying "some 80 health days," including the showing of films to school children, luncheon hour talks to factory and store employees, afternoon addresses to mothers, etc. There were many distinguished speakers at the opening Conference, and the report is full of meat. The claim was made by one speaker—with a great deal of truth we believe—that the English government, the local authorities, voluntary organizations and workers, and the medical and allied professions, have for some time been building up a network of health services which is probably not equalled by any other country today.

In spite of all this the Chairman of the Council of the British Medical Association said, "The respect paid to preventive medicine in medical education today is lip service only." There is a certain amount of learning which is necessary to pass the examinations and the charge is made that that is the chief object of the student in these courses. The Chairman also said that "neither the teachers nor the examiners had any close acquaintance with the machinery of public health service, and the senior student is not taught, as he should be, his relationship to the profession as a whole, to the public, and to the State." Even allowing for some pessimism, we fear this is too true and that almost the same statement can be made for America. Indeed, in America we are more "practical" and even more apt to be concerned in the money making side of our profession than our confreres in England.

The statement was also made that there was never a time when young people especially were so much interested in the health matters, being keen to preserve and improve their physical health by proper clothing, exercise, etc. It was pointed out that one great drawback was that so much of the advice came from the proprietors of commercial products whose motives were not disinterested.

"The remedy is to drown the voice of selfish interest in a stream of unbiassed advice whose sources are unimpeachable."

Sir Philip Henriques laid stress on the fact that good public relations depend upon encouraging not merely the use but also the appreciation of the health services offered. For years it has been the habit of the writer to devote a lecture in a class on preventive medicine to the health services offered by the federal, state, and local governments. He has often observed that the average person does not know where to apply for information on health matters. At several universities perhaps more applications for examination of water and advice on health matters go to the agricultural department than elsewhere, probably due to the extension services which are so numerous and active, and this is true even of some universities having medical departments.

One of the speakers laid stress on the part to be played by the family doctor in the health campaign. He compared regimentation such as was carried on during the Great War with the results of individual appeal, such as can be made by the family physician. In Great Britain the feeling is strongly against regimentation and in favor of individual appeal. Lord Horder said, "To endeavour to make a nation fit by this method (individual appeal) is the last test of democracy." He stressed also that length of life was not the most desirable thing. He said what he had in mind when he spoke of fitness was "health and happiness," and that the chief object of a good administration should be to make life better and happier for the individual. "Better and happier" should be synonymous with "healthier." While in agreement with these statements, in this country certain of us have stressed the idea of efficiency, and still think that is probably the best term to cover what is meant.

In America while health education is not being neglected, special stress is at present being laid upon certain diseases, notably syphilis and pneumonia. There can be no question of the value of these campaigns, as well as others along similar lines—malaria, for example—but after all, we are somewhat inclined to favor the English plan and English ideas rather than our own, never forgetting—what we have said, many times—that in our Public Health Service, we believe that we have the largest and best trained body of sanitarians in the world. We are all, however, working toward the same end and each of us can learn from the other. Just at present we feel that the English method is more fundamental and goes to the root of things somewhat more than what we are doing in America.

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SANITATION IN THE NEXT WAR

IN the present turbulent state of world affairs, war seems, unfortunately, to be more than a remote possibility. If this country should be forced into another conflict, the plans of our War Department call for the almost immediate mobilization of 300,000 citizen soldiers, and the mobilization of an army of 1,250,000 within four months.

The sudden assemblage in hastily prepared camps of such a vast army of young men who are more or less susceptible to various diseases will confront our military and civilian authorities with certain acute public health problems.

In order to deal with them, there will be needed at once an expert and extensive sanitary organization, which will insure (1) adequate supplies of pure water, (2) the proper disposal of sewage and waste, (3) the elimination of insect carriers of disease, (4) the supervision of the hygiene of housing and ventilation, (5) the safety of food supplies, and (6) the control of other matters of environmental sanitation. In addition, there must be provision for necessary medical, dental, nursing, and veterinary care, and for general administration.

To cope with these important problems, what have we at present? According to the report of the Surgeon General of the U. S. Army for 1936, there were then about 1,300 officers and 8,400 enlisted men in the Medical Department of our regular army, and about 1,400 officers and 11,350 enlisted men in the Medical Department of the National Guard. In addition to this small but well trained group, there were some 22,000 reserve officers, of whom about 13,500 were in the Medical Corps, 5,100 in the Dental Corps, 1,500 in the Medical Administrative Corps, 1,000 in the Veterinary Corps, and only about 400 in the Sanitary Corps.

While the medical officers of the regular army are familiar with sanitary procedures, those of the reserve corps are, in general, practitioners of curative and not preventive medicine. Much of the responsibility for sanitary measures during mobilization and combat will, therefore, devolve upon the members of this relatively small Sanitary Corps.

Of the approximately 400 officers in the Sanitary Corps Reserve, moreover, only about 100 are qualified sanitarians. The remainder include statisticians, psychologists, nutritionists, personnel and supply officers, medical procurement experts, laboratory workers, and various miscellaneous scientists and others, who should properly be in a Medical Auxiliary Corps rather than in a so-called Sanitary Corps.

Since the public health experts of the Sanitary Corps will have duties of tremendous significance in times of military emergency, this corps deserves much greater peace time recognition than it is now receiving from army officials. Promotion in this corps is stagnant, and has been for years, with consequent detriment to interest and morale. Training is inadequate, and no definite provision has been made for the assignment of qualified field officers of the corps to supervise necessary sanitary activities in corps area service commands during mobilization, despite numerous recommendations to that effect from qualified sources. A war could be won or lost in the time that has elapsed in the consideration of these important matters.

The United States has never been completely prepared for any war in which it has engaged. It should be adequately prepared for the next one, not only with respect to the might of its armed forces, but with due regard to the care of their health. If the nation is thus properly prepared, there may never be a next war.

SERODIAGNOSIS OF SYPHILIS

THE program for the prevention of syphilis is progressing most satisfactorily. This additional impetus to the effort to find cases has stressed the importance of laboratory aids in diagnosis. In many instances the disease would have been overlooked if the results of serological tests had not suggested its presence—hence, the importance of dependability in the laboratory findings.

The Health Organisation of the League of Nations has for some fifteen

years been investigating the efficiency of various serological tests and the Laboratory Section of the American Public Health Association has been studying the problem since 1922. The U. S. Public Health Service is now also engaged in an evaluation of the serological tests for syphilis performed in this country. The Laboratory Section, at the 1937 meetings in New York City, passed a resolution sanctioning the recommendations made by Dr. Parran and his collaborators.[1] The Referee for this section on serological tests for syphilis, in her report for 1937,[2] suggested that further requirements in regard to personnel and additional facilities might be advantageous. The Associate Referee explained the value of the quantitative test in the evaluation of the significance of the laboratory findings.[3]

The means proposed for achieving higher standards of work differ chiefly in regard to the placement of responsibility. While the importance of the proper training of technicians requires no emphasis, the need of adequate supervision of the laboratory as stressed in the report of the referee is essential. For ultimate success, the director of a laboratory must have had appropriate training and experience and assure himself that members of his staff are thoroughly capable of performing the duties assigned to them. The provision of standard sera has been most helpful in the production of antitoxins; similarly, reliable sources of reagents for serodiagnostic tests should be of equal importance.

With the development of methods which permit a quantitative determination of the activity of the serum in the complement-fixation test for syphilis, it is possible to report to the physician a numerical value which is a direct index of the titer of the serum. Such data promise to be increasingly helpful, not only in diagnosis but in prognosis and as a guide for treatment.

These problems cannot be considered without attention being paid to the cost of the work. Sufficient funds should be available to provide adequate facilities, and to maintain a competent staff with sufficient personnel to permit careful work. False economy never pays; it is particularly dangerous when applied to the laboratory.

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CHEMOPROPHYLAXIS IN POLIOMYELITIS

IN 1935 workers at the National Institute of Health [1] announced that certain astringents introduced into the nostrils of monkeys tended, during a limited interval, to prevent the development of intranasally inoculated poliomyelitis.

This fact has been further elucidated at the National Institute of Health [2-4] and confirmed and extended by independent workers, notably at Stanford University [5-9] and at the Rockefeller Institute for Medical Research.[10, 11]

This protection is believed to depend upon a local action of the chemicals upon the terminals of the olfactory nerves which apparently constitute the portal through which the virus reaches the central nervous system in intranasally inoculated monkeys.

Whether chemoprophylaxis will prove effective against naturally conveyed poliomyelitis in man can only be determined by extensive controlled field trials employing a method of application capable of completely covering the olfactory area in a high proportion of persons treated. The finding of such an effective method of application has proved difficult. The ordinary atomizer as employed in Alabama, Tennessee, and Mississippi in 1936 proved ineffective.[12] Judged by the loss in the sense of smell, the method devised at the University of Michigan was effective in completely covering the olfactory area in only about 24 per cent of persons to whom the 1 per cent zinc sulphate–1 per cent pontocaine spray was administered at Toronto during the 1937 outbreak.[13]

Failure of thorough application of chemicals to the olfactory areas, therefore, offers a possible explanation for the poor showing of the method in these field trials where the apparent reduction in poliomyelitis among the sprayed as compared to the unsprayed group was so slight as to be statistically inconclusive.

The Toronto applications were made by the method devised at the University of Michigan[14] which employs a special spray tip inserted past the middle turbinates, which constitute the chief obstruction preventing ordinarily applied sprays from reaching the olfactory area. This method was advocated for use by specialists only but was found to be too time consuming to be a practicable procedure in the face of an epidemic; furthermore, its application is difficult in children too young to coöperate by holding still.

The spray is not pleasant to take and is often followed by varying degrees of local burning and headache lasting from a few minutes to several hours. Moreover, these unpleasant features which were most usually noted in adults might have been even more in evidence had the application been more uniformly thorough. Following the zinc sulphate sprays, loss of smell in varying degrees was commonly noted and, in some instances, the impairment persisted for a number of weeks. Serious permanent injurious effects were not observed, however, in any case.

Attempts to find a simpler, more satisfactory effective method of covering the olfactory areas in man are being made and it is to be hoped that they may succeed in order that chemoprophylaxis may be finally evaluated and possibly further light be thrown upon the method of natural infection for poliomyelitis in man.

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THE USE OF ANTITYPHOID VACCINE DURING EPIDEMICS

THE health authorities in England are very much disturbed over the outbreak of typhoid fever in Croydon, which is practically a suburb of London, while London itself has remained free from the disease. Hearings are being conducted and a number of lawyers representing several interests are taking part.* [1] According to the statement of the Health Officer in answer to questioning, the source of the epidemic has not yet been determined.

In the English journals much enlightening discussion is being carried on over the question of how to protect individuals who have already been exposed to infection. Is the use of antityphoid vaccine justifiable in these cases? Sir Almroth Wright laid considerable stress on the "negative phase" which followed the administration of any vaccine, holding that until the response took place and immune bodies were produced the individual had a lower resistance and was theoretically more liable to the disease than before.

In America this fear has not been allowed to have too much weight. In 1913, two outbreaks of typhoid fever occurred in Wisconsin, one in a county hospital and one in a village, in both of which antityphoid vaccine made after the method of Wright was used.[1] In both outbreaks the vaccines seemed to produce the most favorable effects. In the first there were 106 contacts vaccinated and 1 case of typhoid fever occurred after the vaccination. It was observed at the time that the case was mild and the comment was made that the vaccine seemed to exercise a favorable effect when given during the period of incubation. Certainly there was no evidence of harm being done. In the epidemic in the village, 116 contacts were vaccinated and 1 case of typhoid fever was reported among the vaccinated. In a report to the American Philosophical Society, the ground was taken that even where the vaccine failed to prevent clinical disease, it apparently had a good effect in modifying the severity of a subsequent attack. It is recognized that the cases observed were too few on which to base far-reaching conclusions, and further that there was no statistical analysis, such as that made by Ramsey.[2]

Perhaps the best study made on the effect of vaccine on contacts has been made in this country.[2] Vaccine was given to 2,402 household contacts, among whom only 9 subsequently went down with typhoid fever. Among 2,886 unvaccinated contacts, 203 had the disease. The author, Ramsey, pointed out that these figures were not comparable, but gave a correct analysis of his data as follows:

	No. of Cases	
Vaccination Status	*Expected*	*Observed*
After third dose	25.06	6
Between second and third doses	13.54	8
Between first and second doses	18.47	9

He believes that the figures from the first to second and from second to third doses of vaccine, the differences between expected and observed cases are of

* On the last day of the hearing (January 11) it was announced that the total cases numbered 290, no fresh cases having been notified for several days. The number of deaths was 38. A bulletin outside the town hall stated that 6 patients were still dangerously ill with typhoid at Mayday Hospital, and 7 others seriously ill.[9]

doubtful significance, but raises no question concerning those contacts who have received three injections, and concludes that among household contacts of primary cases which either remained at home or were hospitalized there is a reduction of 75 per cent from the expected secondary case incidence.

The discussion in the English journals is useful in bringing out a number of facts apparently not widely known, which we hope will for all time allay the fear of people over the "negative phase" as far as typhoid fever is concerned. In 1915, there were 14,836 Belgian civilians inoculated in Ypres in face of a danger very much more imminent than that in Croydon. Indeed, the Belgian Government made antityphoid vaccination compulsory with penalty of expulsion from the country. While the observations are not entirely exact, there is no known instance of increased susceptibility among the many thousands of persons vaccinated.[3] Another writer challenges the opponents of vaccination of contacts to quote statistics in support of their view.

In contrast with the attitude of the *British Medical Journal,* is an editorial in the *Lancet,*[4] which lays some emphasis on the "negative phase" following vaccination. "The transient effects of the negative phase, even if we regard them as negligible in an uninfected person, may well disturb an already changing balance between parasite and host to the disadvantage of the latter." This editorial fortunately brought out a very strong letter from Sir J. C. G. Ledingham,[5] who says flatly that he is in complete disagreement with the ideas expressed in the editorial, and in general agreement with those of the *British Medical Journal* of the same date.

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PROTECTION AGAINST POISON GAS

WE have called attention to the numerous notices of antipoisonous gas activities in England, which no doubt are a constant surprise to people in this country. The letters from England to the *Journal of the American Medical Association,* for example, frequently have items of some length on the movement. Gas masks are being manufactured by the millions and being distributed to the people generally, and studies are being made over one of the most perplexing problems; namely, how to protect infants and young children. The most recent report [1] is that the British Red Cross Society has awarded nearly 33,000 certificates for first aid in chemical warfare, of which 5,734 are held by students who have successfully completed the advanced course of training. In addition to this, the society now has 1,864 fully qualified instructors available for teaching.

Just what this all means is more or less of a puzzle, but it is evident that the authorities must believe there is a real danger which needs to be provided against.

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TO THE EDITOR

THE very remarkable address of Miss Josephine Roche on "Medical Care as a Public Health Function," delivered at the New York meeting of the Association and published in the December issue of the *Journal*, closed with the following two paragraphs:

> The situation calls for leadership. No one formula or program will probably be found adequate to meet our varied needs, but a composite of many efforts and plans, some in experimental stages, some not yet under way, can and must be found. What group is better fitted to lead and carry through than the public health profession with its medical personnel and its traditions of fair dealing with the public and the medical profession alike?
>
> A far step forward would be taken, I think, if the American Public Health Association formally recognized the problem of the present unequal distribution of medical services, and the widespread human need of today, and charged a special committee to coöperate with the U. S. Public Health Service in extending through proper methods the long accepted functions of public health work to meet modern demands and needs of our people. I hope this action may be taken.

The Scientific Session immediately by unanimous vote, requested the Governing Council to authorize the appointment of such a committee. This was done by a resolution proposed by Dr. E. S. Godfrey, Jr., State Health Commissioner of New York, which reads as follows:

> RESOLVED that a special committee of this Association shall be appointed to study the public health aspects of medical care and to coöperate with the United States Public Health Service and other Federal agencies represented in the President's Interdepartmental Committee on Health and Welfare, the American Medical Association, the American Dental Association, and other appropriate bodies in extending public health work to meet modern needs, especially those occasioned by the increasing importance of chronic diseases as causes of sickness and death. Such committee shall be appointed by the Executive Board at its next regular meeting.

At the meeting of the Executive Board, Drs. A. T. McCormack of Kentucky, J. N. Baker of Alabama, and John L. Rice of New York, were appointed a committee to invite the cooperation of the U. S. Public Health Service, the American Medical Association, and other interested agencies, in a study of the medical and public health needs of the people of the several states. The committee met with the officers and the Executive Committee of the Board of Trustees of the American Medical Association in Chicago on December 20. Dr. C. E. Waller, Assistant Surgeon General, represented the U. S. Public Health Service at the Conference. In order that the American Medical Association might realize the acute problem that had been raised by Assistant Secretary Roche's address, Dr. McCormack read it in full and he and Dr. Baker presented certain preliminary data which should be explored and expanded by all the interested agencies. On behalf of the Public Health Service, Dr. Waller stated that the Service had no concrete plan for meeting the medical care problem to submit to the Conference at that time, but pointed out the urgent need of an immediate solution of the problem. He urged that both the Board of Trustees of the American Medical Association and the American Public Health Association give the problem their most serious consideration, and recommended that a study be undertaken to determine

more accurately the nature and extent of the problem—especially the need for more adequate medical service for the groups that cannot afford to pay for such service. Dr. Waller also made it clear that the Public Health Service does not favor any plan which would call for the socialization of medicine or for the regimentation of physicians in this country, nor does it advocate any change in the method of practice of medicine which would alter the present physician-patient relationship.

After full and frank discussion, the Board of Trustees of the American Medical Association adopted the following Resolution:

WHEREAS, a varying number of people may at times be insufficiently supplied with needed medical service for the maintenance of health and the prevention of disease; and

WHEREAS, the means of supplying medical service differ in various communities; be it

RESOLVED, that the American Medical Association stimulate the state and county medical societies to assume leadership, securing coöperation of state and local health agencies, hospital authorities, the dental, nursing, and correlated professions, welfare agencies, and community chests, in determining for each county in the United States the prevailing need for medical and preventive medical service where such may be insufficient or unavailable; and that such state and county medical societies develop for each county the preferable procedure for supplying these several needs, utilizing to the fullest extent medical and health agencies now available, in accordance with the established policies of the American Medical Association. Be it further

RESOLVED, that the Board of Trustees of the American Medical Association establish a committee to coöperate with the Bureau of Medical Economics in outlining the necessary procedures for making further studies and reports of the prevailing need for medical and preventive medical services; and that the Secretary of the American Medical Association arrange to develop such activities through the secretaries of state and county medical societies in each instance, urging the formation of special committees in each county and state where committeees are not available for this purpose.

The American Public Health Association feels that Assistant Secretary Roche came to it as an official representative of the people of the United States and presented a case. The Association proposes to assist the U. S. Public Health Service, the American Medical Association, and other interested agencies in making a diagnosis of public health and medical needs in the United States. It is of the utmost importance that this should be done frankly and honestly and without preconceived and empiric notions as to the remedy that will be suggested; that will be a matter for the sound judgment of the national organizations involved.

As implied in the resolutions adopted by the Board of Trustees of the American Medical Association, the organized medical profession throughout the United States will be appealed to for the purpose of giving aid along two definite and concrete lines; first, to define more clearly the problem of medical needs as they relate to the several states and sub-divisions of government within the states; and, secondly, to develop procedures looking to an amelioration of existing needs.

The Governing Council in announcing its earnest purpose to coöperate with the U. S. Public Health Service, the American Medical Association, and such other agencies as may be invited to participate, desires that each public health agency, official and voluntary, in the United States, join in an earnest endeavor to see that a careful inventory of public health and medical needs of the people is made.

ARTHUR T. MCCORMACK, M.D.,
Chairman

Committee on Public Health
Aspects of Medical Care

PUBLIC HEALTH EDUCATION*

For Kansas City in October—Examples of graphic and dramatic presentation from various cities and states would be timely at the A.P.H.A. meeting in October, 1938. There should be space at Health Education and Publicity Headquarters for showing displays and for staging demonstrations, usually not possible at the Annual Meeting.

Who does an effective bulletin board display in office, lobby, or in hallway of a city hall?

How does some one *effectively* display posters or placards at a clinic? (Not the unplanned posting of heterogeneous posters in any bit of vacant wall space.)

In what schools do social science classes produce graphic presentation of health facts?

Are there manual training classes or other craft groups which might become interested in the production of illustrative devices, doing a double educational job in the school, and making available unusual material to interest parents and other adult friends?

Are there health workers skilled with tools, camera, scissors, paste pot, pencil, or other equipment, who might experiment with graphic presentation?

Suggestions on any of the above possibilities will be supplied upon request to the editor of this department of the *Journal*.

What Is Visual Education and How?—The visual phase of health education in schools has been but lightly touched by health agencies. The possibilities for coöperation with the schools will be developed in a later issue.

But whatever we do should be based upon an understanding of visual education as it is in at least the more progressive schools and school systems. For this purpose an invaluable aid is "Audio-Visual Handbook," by Ellsworth C. Dent, who has a long experience as a teacher of teachers and a leader in visual education.

The book tells concisely about the different visual mediums, how they are used in schools, how to make them or to assemble them. There are classified reading references, lists of sources of equipment and materials.

A paragraph from the chapter on "Organizing the Audio-Visual Service" is addressed to school people, but carries a message for health workers who seek to coöperate with the schools.

> It has required several years of blundering and sometimes painful experience for schools and school systems to realize that visual instruction plans, to be effective, must take into consideration the curricula of the schools concerned, the general plans of the various departments, and the specific plans and needs of individual teachers. Otherwise, as actually happens when visual aids are used haphazardly, there will be waste of time, money, and teaching effort. All three are too limited to be applied in any but the most effective manner. . . .

This little volume promises to be useful to the national or state agency which would plan materials for school use; to the local executive or staff member who wishes to approach the schools with understanding and utmost help-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

fulness. The worker in adult education will find much that may be utilized outside the schools. And it would seem that staff training on the job, and instruction in the professional school could be more interesting and effective in the light of what this book contains.

"The Audio-Visual Handbook." Society for Visual Education, 327 S. LaSalle St., Chicago, Ill. 182 pp. *Paper, $1.25; Cloth, $1.75.*

Talk Warily and Wisely — A "Social Hygiene Day" speaker referred briefly and almost casually to a high proportion of college students as having sexual experience, with the added statement that "girls are becoming less chaste and boys more so."

The newspapers, as representing the interests of the public, promptly followed this lead, and interviews flourished, headlines blossomed.

The immediate result seemed to be that public attention was diverted from the main issues to be emphasized by "Social Hygiene Day."

At any rate we have in this incident a fresh reminder of the danger when a speaker makes casual reference to spectacular situations, or makes broad factual statements for which there is but limited statistical evidence.

One might believe that social hygiene program committees should prepare carefully worded reminders or warnings to their prospective speakers. Included might be emphasis upon the need of avoiding incidental references to spectacular situations, where time or relevancy rule out carefully detailed statements.

Along with this should go a request that generalizations without accepted proof of their accuracy should be avoided.

Listeners and readers alike may easily pick out, isolate, and accept as being of major importance an idea or a fact a long way from the central theme of the talk or paper.

If we fail to warn our speakers we should not quarrel with newspapers or audiences which miss something we believe to be of prime importance.

Don't Waste a Newspaper Man's Time—Get acquainted with your newspaper men and women, but be discreet in breaking in upon them during busy business hours—is one message from David Resnick in "Social Work and the Press," in *Better Times,* 44 E. 23d St., New York, N. Y. Feb. 7, 1938. *35 cents.*

> Much of the difficulty of social agencies is caused by ignorance of news values, inability to tell a story in journalistic language, or unfamiliarity with newspaper methods. If there is any secret of success in successful publicity, it is this: search for news, write it as a news story, send it in the mail, and trust to luck.
>
> In order to get along with reporters and editors, it is often more important to know what *not* to do than what should be done. One reason for the irritation felt by reporters and editors is the waste of their time by health and welfare executives—and the amateurs in publicity—whose very important story is just another dull item to the newspaperman, for the latter is conditioned by daily contact with the varied and exciting happenings of our complex modern world. . . .
>
> Another mistake is to bother working newspapermen in their offices by dropping around—especially near edition time—with a statement or picture which should have been mailed, an idea for a feature, or a vague request for "coöperation." A minor but annoying offense is to call a newspaper man needlessly on the telephone—and break in on his writing or editing a story—to discuss something which should have been sent as a memo to be read at his convenience.

The come-back from some of our readers will be that *they know* their newspaper people, and know the welcome that is extended to them as health workers. Happy indeed is the lot of those who have such informal contacts. ***But be sure that you do know.***

"Topics-of-the-Month" in Indiana—Says *Journal*, Indiana State Medical Assn., Indianapolis:

In the January issue of *The Journal*, there was outlined a plan for work for the year 1938, and the plan included the idea of selecting an appropriate subject for each month, to be emphasized on the President's Page, to be discussed in *The Journal*, and to be offered as a topic for discussion at one meeting of each county medical society during the month. It is suggested that each subject be presented in such a manner as to stress its economic and public health or community aspects. The next eleven months will have the subjects as given below, and they are given in advance so that each county medical society secretary can make use of them in preparing programs, and so that each physician can have an opportunity to prepare himself to discuss the subjects: February—Syphilis . . . March—Pneumonia . . . April—Diphtheria . . . May—Maternal and Infant Mortality . . . June—Crippled Children . . . July—Highway Accidents . . . August—Occupational Diseases . . . September—Annual Physical Examination and Attention to Heart Diseases . . . October—Conservation of Eyesight . . . November—Tuberculosis . . . December—Smallpox.

"How to Win Prospects—And Influence New York's Health" is a small 4 page folder by Dale Carnegie, Chairman, Speakers' Bureau. United Hospital Campaign Committee, United Hospital Fund, New York, N. Y.

The 8 ways to help win people to your way of thinking which I outlined in my book, are the same 8 ways to help win gifts for the support of the essential health services protecting the people of New York.

Briefly repeated, these are as follows.

1. The only way to get the best of an argument is to avoid it.
2. Show respect for the other person's opinion. Never tell a man he is wrong.
3. If you are wrong, admit it quickly and emphatically.
4. Begin in a friendly way.
5. Get the other person saying "yes-yes" immediately.
6. Let the other man do a great deal of the talking.
7. Try honestly to see things from the other person's point of view.
8. Let the other man feel that the idea is his, not yours.

As far as gift solicitation goes, these 8 general methods of dealing with people may be narrowed down to 5 specific goals you will be shooting at. The goals will have to be reached one after the other, so I have attempted to list them below.

First—Know the facts. You know what the hospitals are and what they do. You know how they protect the community's health. You know the broader program of health protection which is being undertaken through integration of medical social service, convalescent care and home care with the active hospital treatment of the sick. You have made yourself familiar with this information at meetings and by reading the campaign literature. Aren't these facts, which convinced you, the same as will convince your prospect? So, Step One is: KNOW YOUR FACTS.

Second—Be interested in your prospect. You have studied his record to find out how much he should give. This interest in him will, in turn, help interest him in you and your appeal. Besides, it is what makes possible getting an early yardstick gift from your best prospect as a challenge to those you see later on. So, Step Two is: STUDY YOUR PROSPECTS.

Third—Remember the value of time. You cannot afford to take a chance on your prospect not being able to see you. So you make an appointment. Will not this make him realize the importance of your call? It will also ensure you an opportunity for personal solicitation. Let's call Step Three: MAKE AN APPOINTMENT.

Fourth—Know what is needed. You realize how much the hospitals dig into their own pockets for free care. You know that the 3-cents-a-day plan does not provide funds to meet these extra needs. You understand then why they need support. In the same way you can make your prospect realize why the hospitals need his gift and the gifts of the other executives of his company. Why they also need a corporate gift equal to $4 for each of the company's employees. Step Four, then is: GET BOTH EXECUTIVE AND CORPORATE GIFTS.

Fifth—Have full confidence. There is no question in your mind about the need of the voluntary hospitals. Knowing their value, you have no doubt that the money will be raised.

My work in life has been to teach people the confidence they need for success. When they have that the battle is nine-tenths won.

You already have this confidence. That makes me, for one, sure of the campaign's

success. Sure that New York will have the continued protection of its voluntary hospitals. So Step Five is: LET'S START NOW, AND SEE OUR FIRST, AND BEST, PROSPECT TODAY.

Health Education in the Journal—Health education material in *American Journal of Public Health,* Jan., 1938:

In "A State Cancer Program," by Chadwick and Lombard, on page 15, as one of 5 main features gives "Education of physicians and the laity regarding cancer." On pages 18 and 19 the present educational program in Massachusetts is considered.

In "Diabetes—An Important Public Health Problem," by Bolduan, the functions of a proposed, and now realized organization, is stated to include:

To carry on health education of the public in all matters pertaining to diabetes.

Under "Books and Reports" (pages 99–100) reviewers call attention to errors or omissions such as are so frequently mentioned under this heading. And, writers and publishers please note, such comment might easily have been avoided. These books needed more adequate editorial supervision, and more critical advance reading by outsiders before being put into final form.

In "A Selected Public Health Bibliography With Annotations," by Patterson, pages 104–105, are several references to education.

"Pneumonia Film," page 112, announces a new motion picture.

In **Hygeia for Feb., 1938**—*Hygeia* (535 N. Dearborn St., Chicago, Ill.) has bettered its cover pages by the use of photographs bleeding over one or more edges of the page.

Fourth of July accidents ("State legislatures should be informed of the facts and the most effective means of combating the menace") . . . Outwitting arthritis ("It can be done") . . . X-rays: a way to better health through photography . . . Modern medical charlatans ("a word for the wishful") . . . Your age and your heart . . . This little pig (had trichinosis) . . . The choice of a marriage mate (10 point specification) . . . Eyes in industry (Effects of illumination) . . . Diabetes (and insulin) . . . Your skin (15 pictures) . . . Open wide! (Give the dentist a chance to serve you early) . . . "I'm not afraid of cancer!" (But, fight it!) . . . The story of human energies (The power plant illustrated) . . . First aid for fractures in skiing . . . Do you snore? (What to do about it) . . . Old dogs and new tricks (The story of Ivan Pavlov) Your health! (Health teaching helps by radio) . . . Questions and answers . . . New books on health.

In "School and Health":

Building the health curriculum in the high school . . . A dental score card for the junior high school (Malden, Mass.) . . . Body building and regulating foods . . . All in the day's work (Emotional problems met in Syracuse, N. Y.).

COMMERCIAL GADGETS

Some of us are pioneers in spirit; to experiment with the new is a delight. These adventures will test new devices, materials, processes, and, we hope, report the results in these pages.

The information offered under this heading comes from reputable sources, but usually it is all too new for the editor to give personal testimony.

Some of the commercial gadgetry will be found under "Exhibits," or other special headings.

You use pencils of 2 colors in editing copy, checking lists, correcting students' papers? Autopoint Co., 1801 Foster Ave., Chicago, Ill., now offers through local stores a "Two-color Autopoint," with selected colors indicated on the tips. Red, blue, yellow, green, purple, or black. Also hektograph leads.

The latest of numerous devices for fitting copy and type is "The Automatic Character-counting Roto-Typometer and Graphic Arts Calculator." Roto Calculating Devices Co., 354 Roger Williams

Ave., Highland Park, Ill. *$2.50.* The 9 inch square device counts typewritten or printed copy by *number of characters* (not number of words which are so variable as to number of letters); gives amount of space needed in a given type face; and so on. A small 4 page folder tells how to make it work in solving copy fitting problems. The manufacturer will send "Roto-Typometer" on approval for examination and test.

Typewriting, carbon copies, drawings, etc., on any good grade of paper may be prepared easily and cheaply for blue-printing. The method may prove useful: to secure an extra copy or two of an important document for immediate use, or for preservation; as a novel form of presentation of important facts or statistics to a board or committee (budget committee of a community fund?); as a novelty invitation or announcement to a small group. The job is done by a diethyl phthalate-solox solution to the paper. For details address U. S. Industrial Alcohol Sales Co., 60 E. 42d St., New York, N. Y.

FOR EDUCATION AND REFERENCE

Modern salesmen in many lines are encouraged to carry ideas and information to pass on to their customers. Many of these salesmen are assured of a welcome because of the real help they bring along with their sales talk.

Increased interest and coöperation may be won by health salesmen who pass on selected copies of reprints, pamphlets, copies of radio talks, etc.

Under this heading may be found, from time to time, just what an alert editorial writer could use to advantage. Rotary president may welcome something else. Something may be found for the mayor, or the chamber of commerce secretary, or the woman's club program chairman. Such single items, handled by the health worker in retail fashion, may in time bring wholesale returns.

Of course much that is mentioned here will be of value only to administrator, the health educator, or some other staff specialist.

"A Baby Pays for Her Parents' Neglect" is an 8 page mimeographed booklet re-issued by the Middletown, N. Y., Health Dept. This anti-diphtheria document, written by Mildred D. Shelley, has been broadcast by Winston-Salem and Jersey City, reprinted by Rockford, and published in health periodicals in Washington, New York, and India. We are delighted to record such repeated use of good material. We hope for increased evidences of use of good copy produced in some other city or state.

"Beauty and Preventive Medicine," by C. H. Goodrich, M.D., President, Medical Society of State of New York. An argument for periodic health examinations. Reprint. Address the Society, 2 E. 102d St., New York, N. Y. *Free.*

"Child Labor Facts." The 1938 compilation. National Child Labor Committee, 419 4th Ave., New York, N. Y. *25 cents.*

"A Cold Can Rob You" is a bulletin board placard listing 10 precautions against colds. Employers Mutuals, Wausau, Wis.

Consumer Education Service, Am. Home Economics Assn., Mills Bldg., Washington, D. C. A monthly news letter. Health workers may be interested in the news from Food and Drug Administration and Federal Trade Commission, and of legislation, publications, etc., which have health angles. Hospitals and other institutions may learn about standards, grading, etc. Sample, *15 cents.*

"Methods and Equipment for Home Laundering." (*Farmers Bulletin* No. 1497.) U. S. Dept. of Agriculture, Washington, D. C. Includes section on handling infected clothes, from U. S. Public Health Service. *Free.*

"Publications" of Am. Home Economics Assn., Mills Bldg., Washington, D. C. *Free.* Classified list.

From American Social Hygiene Assn., 50 W. 50th St., New York, N. Y.:

"Facts About Syphilis." 4 pp.

"Facts About Gonorrhea." 4 pp.

"Safe Motherhood and a Healthy Child." 4 pp.

"Congenital Syphilis," by J. Marshall. 8 pp. Reprint. *5 cents.*

"The Newest Generation," by W. F. Snow. 10 pp. Reprint. *10 cents.*

Frequently single copies of federal government publications will be supplied free upon request direct to the government office where they originated, or to your Congressman. Early application is desirable.

For a list of state and city health councils, and minutes of the 1937 meeting of National Committee of Health Council Executives, address the secretary, Howard W. Green, Cleveland Health Council, 1900 Euclid Ave., Cleveland, Ohio.

"The Inside Story of the Depression" is an elaborate pamphlet of 32 pages, 8x10 inches, about a dozen X-ray pictures, which, with a facing page of text in the form of a case story, tells the story of health needs and medical service as they are faced by the Community Chest, Dayton, Ohio. Among the most striking of such appeals! Electrotypes, photographs, or printed pamphlet with local adaptation, may be secured through Social Service Feature Syndicate, Hotel Biltmore, Dayton, Ohio.

"Program for a General Health District and City Health District of Average Size." State Dept. of Health, Columbus, Ohio. 20 pp.

An "autographed steel engraving" of Dr. Edward L. Trudeau, about 11 by 14 inches, is offered for $1.00 by National Tuberculosis Assn., 50 W. 50th St., New York, N. Y.

"Which One?" is a 4 page folder on early diagnosis. "Your Child's Health" is a cyclopedic 6 page folder edited by Public Health Education Committee, Minn. State Medical Assn. Samples from Minnesota Public Health Assn., 11 W. Summit Ave., St. Paul, Minn. We are getting interested in how health agencies prepare the way for a hearing for the cyclopedic type of folder or pamphlet, or do we simply "give them out"?

American Medical Assn., 535 N. Dearborn St., Chicago, Ill., reprints from *Hygeia:*

"Bad Habits in Good Babies." 16 pp. *15 cents* . . . "Marihuana." 2 pp. *5 cents* . . . "The Truth About Candy." 4 pp. *5 cents* . . . "What Science Knows About Cancer." 9 pp. 5½ by 8 in. *10 cents* . . . "What Does Your Baby Put in His Mouth." 22 pp. 5½ by 8 in. *20 cents.*

"Publications of Office of Education, 1930–1937." *Free* of Office of Education, Washington, D. C. Indicates free publications. These new titles probably *free* from the Office. Sold by Supt. of Documents, Washington, D. C.:

"Physical Education in Institutions of Higher Education." 32 pp. *10 cents* . . . "Education of Negroes: A 5 Year Bibliography." 62 pp. *10 cents.* Brief section on health . . . "Student Interests and Needs in Hygiene." 21 pp. *10 cents* . . . "Educational Directory, 1938: Associations and Directories." 69 pp. *10 cents.*

These U. S. Public Health Service publications are sold by Supt. of Documents, Washington, D. C.:

"The Bed Bug." 7 pp. *5 cents* . . . "Public Health Nursing." 14 pp. *5 cents* . . . "The Rat and Ratproof Construction of Buildings." 68 pp. *15 cents* . . . "Some Public Health Service Publications Suitable for General Distribution." 21 pp. *5 cents.*

National Organization for Public Health Nursing, 50 W. 50th St., New York, N. Y., reprints at *10 cents* each:

"The Nurse Stimulates Employee Interest in Safety" . . . "A Study of Volunteer Services" . . . "Student Affiliation With a Public Health Nursing Agency."

For these reprints from "Hospital Survey of New York" address the author, Dr. E. H. L. Corwin, N. Y. Academy of Medicine, 2 E. 103d St., New York, N. Y.:

"Ambulance Service" . . . "Institutions for Convalescent Care" . . . "Control and Coördination Concerned with Organized Care of the Sick."

SAFETY

Accident Prevention Conference of Dept. of Commerce, Washington, D. C., has issued two well done booklets:

"How to Stop Farm Accidents." 22 pp. *Free.*

"How to Stop Home Accidents." 14 pp. *Free.*

In Nov., 1937, school children of New Milford, N. J., riding bicycles to school were required to have license plates on their machines, and to carry riders' licenses. B. F. Gibbs, supervising high school principal, engineered the plan as a safety measure. The license cards bear on the back a 14 point bicycle code.

A book bargain is offered by National Society for Prevention of Blindness, 50 W. 50th St., New York, N. Y. "Eye Hazards," by Resnick and Carris, is a $1.50 book of 247 pages, except that some of the safety devices in the pictures are outmoded. The present bargain price is *50 cents.*

A bulletin board poster attempts to make graphic the baffling characteristics of carbon monoxide gas. At one side of the poster are 4 blank white panels captioned: "What it looks like!" "What it tastes like!" "What it smells like!" and "What it feels like!" Employers Mutuals, Wausua, Wis.

An "Education in Accident Prevention" issue of *Journal of Educational Sociology,* 32 Washington Place, New York, N. Y., is dated Sept., 1937. *35 cents.* Includes

Application of psychological methods to safety education . . . The nonreduction of accidents . . . Mental hygienist looks at safety education . . . Education programs in Cleveland and Baltimore schools. The editorial urges the failure of "spread or transfer," and the resultant need of direct education. Says the editor:

The purpose of this agitational article, therefore, is to urge those interested in education in accident prevention to take the strict Thorndike point of view as a fundamental of psychology; to work from the Thorndike point of view and insist upon specific instruction to meet each specific accident situation of any importance.

The following subjects will be featured in the 1937–1938 issues of *Safety Education,* the magazine for home and school, 1 Park Ave., New York, N. Y. (sample upon request):

Oct., Fire prevention . . . Nov., Safety in the school shop . . . Dec., Holiday safety . . . Jan., Safety lessons from nature . . . Feb., Accident reports and their use . . . March, Bicycle riding . . . April, Spring games . . . May, Vacation safety.

A group of accident and safety articles in *Red Cross Courier,* Washington, D. C. Dec., 1937. Includes review of recent progress in rural extension of first aid.

In the 21st volume is *California Safety News,* the little quarterly issued by Industrial Accident Commission, State Bldg., San Francisco, Calif. A feature of the Dec., 1937, issue is a group of case stories: "Another Scaffold Accident" . . . "Broken Grindstone" . . . "Did He Think?" . . . "Who Was Responsible?" These and other stories appear under the general heading across two pages: "These Accidents Were Caused, They Did Not Merely Happen."

"Quick! Henrietta, the Iodine!" is the title of an article on accident emergencies in the home. *Health,* 105 Bond St., Toronto, Ont. Dec., 1937. *15 cents.*

The National Safety Council reports 106,000 fatal accidents in 1937, with 15 per cent decrease for the year in

the home, 5 per cent decrease in public (non-traffic), 6 per cent increase in occupational, and 4 per cent increase in traffic deaths.

Aetna Affiliated offers "How Good a Driver Are You?" "Check Yourself by taking this safe driving examination." One of the popular self-scoring devices which the alert safety worker can get into use in groups as well as by individuals.

The Committee on Accident Prevention, Canadian Public Health Assn., recommends that—

> Nonofficial local agencies engaged in the education of the public in connection with traffic safety should be encouraged to make use of the services of municipal health departments when planning safety campaigns.

"Guides to Traffic Safety," prepared by Executive Committee of National Conference on Street and Highway Safety, is published by Bureau of Public Roads, U. S. Dept. of Agriculture. Seems particularly helpful to health workers as a general review of the field. There are sections on education, school, and general public. Supt. of Documents, Washington, D. C. *10 cents.*

Home accidents, safe driving, home and community fire hazards are treated in educational material from Aetna Affiliated Companies, Hartford, Conn. Especially interesting is "Let's Be Skillful" with 10 good sized page diagrams of street hazards. (Not quite so clear as they could have been if appearance had been neglected slightly for effect.) These pages suggest their reproduction on bulletin boards, or for school use. In home or school similar problems might be worked out with cut-out pictures of automobiles.

National Fire Protection Assn., 60 Batterymarch St., Boston, Mass., is a source for educational plans and materials for use in schools or elsewhere. "Fire Prevention I.Q." is a 4 page folder; 25 questions, each with 4 or 5 possible answers, the correct answers on the 4th page. Rotary and other luncheon clubs would be interested in getting copies (100 for *50 cents*) to test their members at the weekly meeting. Samples *free.*

"A Pictorial Story of the American Highway" includes a group of scenes to illustrate the statement of the National Safety Council that in many instances the billboard "seriously distracts the attention at such critical locations as underpasses, grade crossings, and abrupt hill crests." In *Roadside Bulletin,* National Roadside Council, 119 E. 19th St., New York, N. Y.

"The Psychology of Accident Causation and Prevention," by H. M. Vernon, M.D. *Trained Nurse and Hospital Review,* 468 4th Ave., New York, N. Y. Oct., 1937. *20 cents.* Accident-proneness and treatment, child suggestion susceptibility in accident prevention.

A surprisingly simple idea for safety education in a small shop is described under "A New Idea In Safety Programs" in *The Foreman,* Employers Mutuals, Wausau, Wis. Nov.–Dec., 1937. In brief, every employee in turn is Safety Marshal for a day. His first duty is to write a 10 to 20 word safety message (warning, reminder, or factual statement) which is posted in a frame where all workers may see it. His second duty is to appoint the Safety Marshal for the next day. The reproduction of one of the messages in its display holder emphasizes the hopefulness of the idea. It might be tried in offices, schools, etc.

A 2 page bulletin on "Special Winter Hazards," Employers Mutuals, Wausau, Wis., mentions slippery walks . . . falling on icy ground (how to fall without injury) . . . frostbite . . . snow on roofs . . . icicles . . . cranking . . . carbon monoxide poisoning . . . and gives bad weather driving hints and how to thaw frozen pipes.

What about safety? This question is raised as the conclusion of "Auto-

mobiles of 1938," by D. H. Palmer, *New Republic*, 40 E. 49th St., New York, N. Y. Jan. 5, 1938. *15 cents.* The article reviews the varied improvements and so-called improvements. Almost anything man may think of is there—except durability, economy, and *safety*.

STAFF TRAINING

"Community Health Education" is one course announced for the 1938 summer session for public health nurses, University of Kentucky, Lexington, Ky. First term, June 13 to July 16.

"School of Hygiene and Physical Education." Reprint from annual report of the President. Stanford University, Calif. *Free.* About Division of Informational Hygiene, Division of Physical Education Activities, Men Students' Health Service, University Health Service, etc.

"Selection and Training of Nurses by a State Health Department," by L. M. Blaisdel. New York State Dept. of Health, Albany, N. Y. Reprint. *Free.*

"Tuberculosis: A list of free and inexpensive materials." *American Journal of Nursing*, 50 W. 50th St., New York, N. Y. Dec., 1937. *35 cents.*

"What Does the Student of Institutions for the Education of Teachers Know about Eye Health?" by A. M. Phelan. *Sight Saving Review*, 50 W. 50th St., New York, N. Y. June, 1937. *50 cents.* Reprint for *10 cents.*

Up in Buffalo it was that 70 or more public health nurses attended the first Institute on Health Education and Interpretation of Public Health Nursing Services conducted by the New York State Dept. of Health. The meeting was planned by Florence Manley, R.N., District Supervising Nurse, and Ethel Hendriksen, Field Agent of the Division of Public Health Education.

The primary purpose of the Institute was to bring about better understanding of the health objectives of lay organizations, such as home bureaus and 4-H clubs, and to demonstrate how guidance by the health officer and the public health nurse is welcomed by these agencies. By careful study of health education methods it is hoped that nurses may make their services in this field more effective.

The discussion centered about the public health nurse and her part in health education, and the community and its resources for health education.

Commonly used technics were presented: radio, newspaper releases, public addresses, reports, and community organization.

MAGAZINE ARTICLES

Articles to read, to quote, to mention in bulletins, to write letters about.

In one year *Look* has reached 2 million circulation and *Life* in 14 months has reached 2 million a week. Possibly we should study both *Life* and *Look* to seek some understanding of the different audiences.

Here is another: *Picture*, 350 E. 22d St., Chicago, Ill. Monthly. *10 cents.* One of the better grade of picture magazines; goes for the "picture essay" form, as it is known to *Life*. In March, 1938, are 4 pages on "How Should You Tell Your Child about Sex?" prepared with coöperation of American Social Hygiene Assn. The opening is a page picture thus captioned:

"Why Is Bobby Different?" Brothers and sisters enjoy an immense advantage over the "only child." When Betty and Bobby swim together they notice the differences in their bodies in the same way that they observe anything that seems unusual to them . . . And they will want to know "Why?" Wise parents explain that boys and girls are formed differently so that they may later become fathers and mothers.

In the same issue of *Picture:* "Diagnosis While You Wait." 4 pages emphasizing, not horribly, that

"This marvelous 'frozen section' method saves lives every day. Suspected cancer

tissue is diagnosed during operations. The surgeon has his answer in 5 minutes."

"And Now, a Co-op Hospital," by A. D. Carlson. (Elk City, Okla.). *Survey Graphic,* 112 E. 19th St., New York, N. Y. Sept., 1937. *30 cents.*

"Crippled in the Tongue," by A. D. Carlson. *Harpers,* 49 E. 33d St., New York, N. Y. Oct., 1937. *40 cents.* Speech defectives.

"Home, Lethal Home," by R. E. Vernor. *Rotarian,* 35 E. Wacker Drive, Chicago, Ill. Jan., 1938. *25 cents.*

"It's startling but true! You're safer"—statistically speaking—dodging highway traffic than in the bosom of your own household.

"How Fast Can You Stop Your Car to Avoid Hitting a Child?" Two pages of pictures showing how "Jerry," a wooden dummy of a boy on roller skates, and an "electric eye" check a driver's reaction in the face of actual accident causes. *Look,* Des Moines, Ia. Feb. 15, 1938. *10 cents.*

The *Ladies Home Journal* has joined the tabulators of "public opinion." The Feb., 1938, issue reports that the women of America believe:

"That young people should be taught more about sex before they get married."
"That sex instruction should be given by their parents."

"Minds That Come Back," by J. D. Ratcliff. *Collier's.* Feb. 12, 1938.

"Insulin shock, the new, violent method of dealing with certain forms of insanity, is as dramatic as medieval magic. And it really works. Dr. Manfred Sakel, its inventor, has brought hope to hundreds of thousands of persons otherwise condemned to a life of constant nightmare."

"Night Call," by W. Martin. *Collier's.* Dec. 25, 1937. "Story of a young doctor whose heart and courage were greater than he knew."

"Now They Are Ahead of the Public," by Douglass W. Orr, M.D. and Jean W. Orr. *Survey Graphic,* New York, N. Y. Feb., 1938. *30 cents.* "The changed front of the British medical profession toward health insurance." What the medical secretary of the British Medical Assn. says.

"Pneumonia Mortality May Be Cut in Half by Use of New Serums." 5 pages of pictures with text. Includes portraits of Dr. Parran and Dr. Rice. *Life,* 330 E. 22d St., Chicago, Ill. Dec. 20, 1937.

"Preying Guests," by Dr. V. G. Heiser. *Collier's.* Jan. 15, 1938.

"The way parasites behave is an open scandal, but nobody can call them dumb. . . . Dr. Heiser describes their adventurous careers and the means at our disposal for stopping them."

"The Student Nurse Prepares for an Arduous But Noble Profession" at Roosevelt Hospital School of Nursing she studies, has fun, cares for the sick. Eight pages of pictures, and cover picture. Practically none of those in the pictures are looking at the camera, and the reader. Text emphasizes the professional training, and the desirable personal characteristics. *Life,* Chicago, Ill. Jan. 31, 1938.

"Traveler's Aid," by Dr. V. G. Heiser. *Collier's.* Jan. 1, 1938.

"If you are going to get any good out of your trip you have to stay well . . . Dr. Heiser, who has spent his life traveling, tells you what to look out for."

"The Unhappy Drinker," by F. T. Chambers, Jr. *Saturday Evening Post.* Jan. 15, 1938. Tells of "the key to the behavior of the unhappy drinker," and explains that

Neither the novice nor the seasoned alcoholic can be helped by emotional appeals or by threats of punishment—as families of drunkards would do well to learn. The problem must be faced in a scientific, matter-of-fact manner, with no more moral judgment brought into play than if the patient were suffering from typhoid fever or a broken leg. The alcoholic is already emotionally unbalanced, and appeals to his better nature

are as useless as appeals to the logic of a man who is insane.

If the abnormal drinker is treated as a medical case, suffering from a common form of mental illness, little damage is wrought his self-respect, and results are more rapidly obtained. . . .

"What 19,000 Doctors Could Tell Us," by Douglass W. Orr, M.D. and Jean W. Orr. *Survey Graphic,* New York, N. Y. Dec., 1937. *50 cents.*

"Dr. and Mrs. Orr have made the first intimate study ever attempted of how wage earning families no less than panel doctors feel about the health insurance system that Britain inaugurated 25 years ago."

"The Workers Say, 'Yes—and More,'" by Dr. D. W. Orr, and Jean W. Orr. *Survey Graphic,* New York, N. Y. Jan., 1938. *30 cents.* British wage earners want more of sickness insurance.

MOTION PICTURES

A 1937 revision of "Medical and Dental Films" is available through Bell and Howell Co., 1801 Larchmont Ave., Chicago, Ill. 73 mimeographed pages. *50 cents.* List of available professional and popular 16mm. films on medical, surgical, health hygiene, and dental subjects. Includes psychology, biology and allied subjects of professional interest. The strictly health pictures are limited in number. A chapter on "Making Medical Movies."

Aetna Life Affiliated Companies, Hartford, Conn., offer films and slides on safety topics for *free* use.

Highway safety: "Saving Seconds" . . . "The Truck and the Driver" . . . "Let's Be Skillful" ("There's no fun being a dub!") . . . "How to Park Your Car."
Fire prevention: "The Bad Master" . . . "Sounding the Alarm."
Home accidents: "Sentinels of Safety."

If you wish to check the use of motion pictures in exposition or fair exhibits see "Behind the Screens at the Century of Progress." Reports on the practice of exhibitors as to silent and talking pictures, amateur and professional, space required, how projector was placed, when chairs are needed, about continuous operation, size of screen, etc., together with a machine manufacturer's arguments for the use of pictures. Bell and Howell Co., 1801 Larchmont Ave., Chicago, Ill. *Free.*

"Social Service and the Films," by Dee Lowrance. *Better Times,* 44 E. 23d St., New York, N. Y. Feb. 7, 1938. *35 cents.* A review of the commercial production of social films, the attitudes of producers, the *March of Time's* presentation of health and other social themes, the documentary films being made in England and the situation in this country. Of interest to health workers as background on health movie production.

"The Why and How of Titles," by J. W. Moore. *Movie Makers,* 420 Lexington Ave., New York, N. Y. Feb., 1938. *25 cents.* Crowded with ideas on when, what, and how. (Other usable material, of course, in the same issue.)

"Without doubt," says Michigan Tuberculosis Assn.:

". . . talking pictures have been the means of interesting many people in tuberculosis. Clearly explaining the importance of the tuberculin test and diagnostic chest X-ray in discovering tuberculosis early, the motion picture program is an invaluable phase of the Association's constant health education campaign. To build up a far-reaching movie program is the aim of the association. During the coming school months, showings will be concentrated in lower Michigan. "Contacts" and "Behind the Shadows" will be presented before as many schools as possible."

"Behind the Shadows" is the first sound movie produced by the National Tuberculosis Association. The same picture has been made with titles for use without sound. Both versions are available in 35mm. and 16mm., *both on safety film.* One reel.

"The photography is of the best; it was done in an eastern studio under the direction

of Holywood-trained experts. Hospital and medical scenes were checked for authenticity by two physicians while the photography was in process. The animated diagrams were executed by the staff illustrator of the Presbyterian Hospital in New York, who is master of animated diagram technic. The sound effects are perfect—good diction, clear enunciation."

NEW

Here's Health is a mimeographed news sheet to supplement *Delaware Health News,* the printed bulletin. State Board of Health, Dover, Del. Part of a news release announcing the first issue follows.

Under the title "Here's Health" the State Board of Health has commenced the publication of a mimeographed house organ, to be sent to board members, staff and interested associates, with the announced purpose of more firmly welding together the workers through keeping each informed of the programs, activities, and problems of the others.

An outline drawing of the State of Delaware and its counties, with small circles indicating the principal communities, acts as a background for the text of the first page, while the title, "Here's Health!" in half-inch letters, occupies the upper right corner. In ordinary publications this outline map will serve to set off the text, but it will be possible to use it for purposes of statistical indication, by typing-in the names of towns or counties, or by indicating them with different markings.

DATES AHEAD

Health agencies generally may make some use of special days, even outside of their own special fields. To remember a special day on the office bulletin board, in a staff meeting, or in the staff house organ will be at least a minor contribution to broader staff interests. Worth while, is it not?

It was in March, 1877, that the first visiting nurse started her rounds.

St. Patrick's Day, March 17, may well be made a peg upon which to hang a health editorial—if suggested to a sympathetic editorial writer.

The first day of spring, March 21, should tempt some special news releases. How about the "sulphur and molasses" of by-gone days?

And April 1 is the day for remembering the greatest of them all, the health fool!

National Negro Health Week, April 3–10, 1938. Plans are outlined in *National Negro Health News,* U. S. Public Health Service, Washington, D. C. Send early request for samples of bulletin, poster, and school leaflet.

Daylight Saving, in many communities, starts the morning of April 24.

National Garden Week, National Boys' and Girls' Week, and National Better Homes Week usually come in April, but no 1938 announcements have been noted.

May Day is not far off. We have heard of no national planning, but doubtless some states and many cities will initiate plans for a Health Day.

"National Hospital Day," May 12, is also "Florence Nightingale Day." What several cities did a year ago is reported in *Hospitals,* 18 E. Division St., Chicago, Ill. Feb., 1938.

A "Drive Safely" poster contest closes April 29, 1938. Prizes of $10 up to $1,000, are offered by Devoe and Raynolds Co., 1 W. 47th St., New York, N. Y., who will send the simple instructions. The "problem" as stated:

To create a poster so dramatic and compelling that it will induce motorists to drive safely—thus reducing the annual toll of accidents in this country which bring sudden deaths to thousands of persons and cause many more thousands each year to live on in the nightmare of mangled flesh and bones.

Money and fame await the artist who can most successfully create such a poster. And to that artist, thousands of persons including, perhaps, members of his own family, will owe their lives!

Early Diagnosis Campaign for 1938 will soon be on. "Uncover Tuberculosis by Modern Methods: 30 Years of Health Education." An 8 large page

pamphlet; tells "Why," "When," "Where," to campaign, "Who" to reach, and "How" to go about it. A striking pyramid emphasizes the audiences and the job to be done. The materials described include pamphlets, posters, talks, newspaper copy, a new movie, exhibits, and several forms of direct national aid. Get copy from some tuberculosis association.

REPORTING

A diagram of activities is included in the annual report of Massachusetts Society for Mental Hygiene, 3 Joy St., Boston, Mass. Simply made, it gives a quick review of what the Society was doing last year.

"Guarding the Health of Kern County" appears in the center of the cover-page and the title-page of the annual report of Kern County Dept. of Public Health, Bakersfield, Calif. *There is a detailed table of contents. There is a page on "Activities in Public Health Education."* There are 3 pages reporting on the coöperating agencies, public and private. There are nearly 2 pages of comment by Health Officer Smith, partly buried as "Conclusions" at the end of the report. This material was worth moving to the front part of the book, and then setting it in larger and more readable type.

Again "Guarding the Health of Baltimore" appears on the blue bound pamphlet which contains "A reprint from the annual report of the City Health Department." Two pages tell about health education. Back of the title page appears this quotation from Governor William Bradford's History of Plimmoth Plantation:

> "Out of smalle beginnings greater things have been produsd by his hand that made all things of nothing, and gives being to all things that are."

New Haven's Dept. of Health annual report *has a table of contents.* The title page carries an upright bar diagram of New Haven's health dollar. We will tell more about the page and a half on public health instruction next month.

On the cover a lighted candle, and these words: "How far that little candle throws its beams! So Shines a Good Deed. . . ." On the title page: "A Decade of Sight Saving: 1927–1937. The Illinois Society for the Prevention of Blindness" (203 N. Wabash Ave., Chicago, Ill.) Inside is a narrative account of the 10 years, with open readable pages, which will not be read through quite as generally, or be remembered as fully, as would have followed the addition of sub-headings.

Here is a new proposition as to publication of reports: All concerned with rehabilitation of the tuberculous know about the Altro Work Shop, which is a major undertaking of Committee for Care of Jewish Tuberculous, 71 W. 47th St., New York, N. Y. Executive Edward Hochhauser announces a comprehensive report of the committee and the 22 years of the Shop; about 80 pages, including contributions by Dr. Kendall Emerson and Louis I. Dublin, photographs and charts. Copies available if ordered in advance. *35 cents,* paper; *55 cents,* in cloth.

IN BULLETINS AND JOURNALS

The most unusual health journal of the month was the Dec., 1937, issue of *Journal of Social Hygiene,* 50 W. 50th St., New York, N. Y. This issue was devoted solely to the 25th anniversary dinner of the American Social Hygiene Association, an event in honor of Dr. William Freeman Snow. There are many pages of addresses, and of messages from those who could not be present.

"Public Health and Social Work" is a new heading under "Books and Periodicals" in the monthly issues of *Journal of Home Economics,* Mills Bldg., Washington, D. C.

Understanding the Child, National Committee for Mental Hygiene, 50 W. 50th St., New York, N. Y., seeks to give atmosphere and information introductory to each of its articles. Usually there is a one column cut of the author. Across the 2 column page is a paragraph about the author and the article. Under "With Our Contributors" are grouped personal notes about some of the authors.

"A Year of Best Records . . . 1937 a Star Health Year" according to *Statistical* Bulletin, Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y. Jan., 1938. *Free.*

Too many capital letters make needlessly difficult the reading of National *Negro Health News.* This difficulty carries over even to the display pages where every word starts with a capital. With capital for first word of a line the whole would look better and read better.

"Book and Pamphlet Notices" is a useful section of *Ohio Public Health,* Ohio Public Health Assn., 1575 Neil Ave., Columbus, Ohio.

"The Doctor's Reply." *Weekly Bulletin,* Municipal Dept. of Health, Albany, N. Y. Dec. 30, 1937. "Doctor, can you cure me?" as answered by Drs. Charlatan, Cocksure, Play-for-time, Pseudo-Honest, Foolishly Honest, Cruelly Honest, and Sensibly Honest.

Health Habits, Iowa Tuberculosis Assn., Flynn Bldg., Des Moines, issued for teachers, is pleasing to the eye because of the substantial light green paper.

Memphis Health Bulletin, Memphis, Dept. of Health, carries a table of contents on the inside cover page.

N. J. T. L. News, weekly mimeographed bulletin of the New Jersey Tuberculosis League, 15 E. Kinney St., Newark) impresses one with the weekly record of extensive and varied health activity in a populous state. The persistent way of the League in supplying, week by week, ready made copy for local use ought to bring educational material into many periodicals throughout the state. Almost all of this material is submitted with suggestions for local adaptation. We hope to receive a report on the extent of actual local use.

This Job of Ours, bearing signature of Health Commissioner John L. Rice, is a weekly, one page sheet, going to the 2,500 employees of the New York City Dept. of Health.

The Nov. 22, 1937, issue began with this paragraph:

> A SILVER LOVING CUP was awarded to the Department last month. It was presented by Namm's Department Store for a window display prepared by the Bureau of Health Education with the assistance of the Chemical Laboratory. As part of the celebration of Brooklyn Day, Namm's gave window space for exhibits explaining the work of the various city departments. The Health Department's exhibit which dealt with the protection of food was seen by thousands. The preparation of exhibits is but one part of the work of the Bureau of Health Education.

Then followed 4 paragraphs telling more about the educational contact of the department with the public, and with professional groups.

"Why Children Die?" in *Birmingham's Health,* Birmingham, Ala., Sept., 1937) is followed by two pages on "The Leading Causes of Death in the Younger Age Groups in Jefferson County." "Under one year," and 7 other periods are given, and for each are the percentages of total deaths for the 4 chief causes of death in the period; at the left a cut of four horsemen of death, at the right a silhouette of a child of the respective age period.

BOOKS AND REPORTS

Annual Report of the Surgeon General, Public Health Service of the United States—*Fiscal Year Ended June 30, 1937. Washington: United States Government Printing Office,* 1937. 164 pp. Price, $.60.

This *Report* is so succinct that a review is somewhat difficult. Only a few of the high points can be mentioned.

Some changes have taken place in the administration. During the year, five offices: Child Hygiene, Milk Investigations, Stream Pollution, Public Health Methods, and Statistical Investigations, which have heretofore operated as separate units in the Division of Scientific Research were merged to form the Division of Public Health Methods in the National Institute of Health.

The Division of Mental Hygiene has completed its 7th full year. Its chief work has been the study of the nature and treatment of drug addiction, carried out largely at the Narcotic Farm, Lexington, Ky.

During the year a plan of "Radio Pratique" was evolved by means of which ships have been able to proceed to dock without stopping at quarantine anchorage and without being subjected to quarantine inspection prior to entering a United States port.

Cholera remains limited to southern Asia and adjacent islands with a high incidence in India, French India, French Indochina, and Siam. Plague was of widespread distribution and attained high incidence in the Far East, in Ceylon, India, and Dutch East Indies; in Africa, as evidenced by reports from Kenya, Uganda, Union of South Africa, and Madagascar; in South America, as reported in Brazil, Peru, Ecuador, and Argentina. Yellow fever appeared to be limited mainly to Africa and South America.

In the scientific work one of the most interesting things has been the continued study of hemolytic streptococcus diseases. A method of purifying and precipitating the erythrogenic toxin of the scarlet fever streptococcus has been developed. The use of such material for active immunization against scarlet fever greatly reduces the objectionable reactions and at the same time increases its immunizing properties. The practicability of the method has been tested in a group involving over 10,000 persons, 85 per cent of whom were susceptible grammar school children and were protected.

The publications of the department have been continued, but it has been found necessary on account of finances to cut the number of pages from an average of 3,000 to 1,700. Many reprints and supplements have, however, been issued, and during the year a new publication called "The Health Officer" has been put out as an experiment in public health education. In spite of the fact that no effort has been made to increase the circulation it has practically doubled.

The Division of Venereal Diseases has been, as might be expected under Surgeon General Parran, active. The American Society of Clinical Pathologists with the Service, has sponsored a project for determining the reliability of serodiagnostic tests for syphilis originated by American serologists, and also the efficiency of state and local laboratories in performing such tests.

In general it was found that the tests are reliable and in most state laboratories the performance of the tests is entirely satisfactory.

Altogether, this report is exceedingly interesting and valuable. It is the story of the work being carried on by what we have often said is the largest and best trained body of public health workers in the world.

MAZŸCK P. RAVENEL

Esperimenti Di Vaccinazione Antitubercolare—*Carried out under the Control of the Committee Technical-Scientific, of the Institute for Anti-tuberculous Vaccination. From the Laboratory of Comparative Pathology of the Royal University and Institute for Anti-tuberculous Vaccination of Milan. Director: Prof. A. Ascoli.*

In the English summary of this Report are given the results of the experiments in the use of immunizing products against tuberculosis in calves.

The experiments were carried out on 94 calves, and two tests for immunity were employed: (1) by injection of virulent bovine bacilli, (2) by exposing the treated calves to animals suffering from open pulmonary tuberculosis, thus establishing a sure source of natural infection.

It appears that the use of live bacilli gave excellent results in immunizing calves against both fatal doses of virulent tuberculous infection and natural exposure to the disease, and that no other form of vaccination, such as the dead heated cultures, is of value in immunization. When large amounts of dead heated cultures were injected in an effort to immunize calves, they not only were not protected but were much more susceptible to subsequent exposure to tuberculosis.

When using living bacilli for immunization unless calves were revaccinated and kept for a certain time after away from natural contagion the protection was not as marked. Unless precautionary measures are carefully observed, even the use of live bacilli for immunization will fail. In other words the precautionary measures are essential to success in immunization of cattle against tuberculosis.

This research represents painstaking investigation which deserves commendation, but the results are a little difficult to interpret because of the way they are expressed in the translation into English.

The situation in which these researches were carried out is perhaps quite different from those existing in the United States but we believe that in general the effort devoted to tuberculosis could much better be given to eradication such as has been carried out in the United States. With the exception of two states, the entire United States at present has been declared a modified accredited area for bovine tuberculosis, which means that in such areas there exists less than one-half of 1 per cent of the disease in cattle.

A. J. DURANT

The Cost of Adequate Medical Care—*By Samuel Bradbury, M.D. Chicago: University of Chicago Press,* 1937. 83 pp. Price, $1.00.

Much has been said and a great deal written about the cost of medical care and of the inequality of distribution of medical service for the people of the United States. There has been some confusion, however, as to the *actual* cost of *adequate* medical care.

This book, written by a practising Philadelphia physician, presents in 12 chapters, 13 important tables, and 9 indices, an interesting picture of what these actual costs are, based upon studies of schedules of fees charged by general practitioners, surgeons, specialists, hospital laboratories, etc.

Chapters are devoted to the ex-

pectancy of illness, to the type of practitioner and kind of service required and the cost for the individual and family for the treatment of certain specific diseases thoroughly analyzed. Good medical care is properly defined and the principle stressed that medical care of high quality cannot be furnished cheaply.

The amount of fact-finding contained should particularly appeal to the medical profession, administrators, social workers and all who are genuinely interested in the subject of medical economics. CHARLES F. WILINSKY

A Pediatrician in Search of Mental Hygiene—*By Bronson Crothers, M.D. New York: Commonwealth Fund,* 1937. 271 pp. Price, $2.00.

But we doubt if he found it! We fear he was searching for the "will-o-the-wisp" and, to boot, quixotically tilting at windmills.

This is a vexatious little book—both because of things it says and those it leaves unsaid. Had the author defined psychiatry *and* mental hygiene he would not have had the need to knock down so many straw men. And also, had he realized that a mental concept does not correspond to any objective reality he would not be looking for the "whole child in a total environment."

In view of the above, one is not surprised that the author can go on for 236 pages and then write, "In the preceding chapters the reader can easily see that the writer has been constantly drawn toward *psychiatry and mental hygiene* (italics mine) and then has withdrawn again and again."

Undoubtedly the author does represent in his thinking many physicians. This may be paraphrastically stated, "That only is scientific which is materialistic hence psychiatry is at best the art of medicine." The reviewer would question both the concepts scientific and psychiatry when so used.

The author states that the pediatrician's primary responsibility is the treatment of the physical ills of childhood, *i.e.*, the diseases due to physical agents. This thought is basic throughout his discussion. But he is not satisfied with just that. He wishes to make growth and development a more meaningful concept. This is what leads to the groping so poignantly expressed in this book. He has come to see that the child when asked may throw light on his dis-ease, and also that it is well worth while taking the time to elicit facts not discoverable on mere physical examination.

In fact, the author is unquestionably doing a nice piece of work at the Children's Hospital of Boston as the chapter, A Teaching Experiment in Action, shows. We are of the opinion, however, that until the day comes when medical students will receive more adequate training in psychopathology and psychotherapy in a more correlated manner than is generally true at present, such attempts at training internes and residents as described by him are at best make-shifts.

Since we agree with some of the strictures against the psychiatrists in extramural work and the propagandists in mental hygiene societies, we would recommend the reading of this book to all such. Medical students and practising pediatricians need more clearly formulated material if it is to be of value to them. Teaching pediatricians may find consolation in knowing that a fairly good practical job can be done even though they too, together with many an extramural psychiatrist, still may be in search of mental hygiene. HENRY C. SCHUMACHER

The Family in Health and in Illness—*By Florence Brown Sherbon, M.D. New York: McGraw-Hill,* 1937. 500 pp. Price, $3.00.

This book was designed as a college

text "to help the young woman student prepare herself for the responsibilities of the family, and incidentally, community life." Its 45 chapters deal with the fundamentals of Family Relationships, Biology, Anatomy, Physiology, Nutrition, Food Chemistry, Public Health, Disease, Bacteriology, Medicine, Nursing, and Emergency Treatments.

The subject matter is presented, not for the technically trained student of medicine, nursing, or dietetics, but for the home maker who has had training in the basic sciences and in Home Economics. Special attention is given to prevention of disease and of accidents; emergency treatments; improvised equipment for nursing; and to entertainment and occupation of the sick. Sick room procedures are presented in a way to enable the home maker to carry out the physician's orders in a scientific and safe manner.

The strongest feature of the book is the excellent manner in which it is illustrated, having 200 figures in all, including diagrammatic drawings, charts, and photographs. These both clarify and create interest in the subject matter. The list of good references at the end of each chapter should be helpful to both teacher and student; and the clear, concise definitions of the new technical terms at the beginning of each chapter would be a great help to the student.

As far as subject matter is concerned, there seems to be very little presented that is really new in any of the many fields discussed. I find nothing whatever new in the chapters dealing with food needs, chemistry of foods, minerals, vitamins, diets, feeding the sick, and emergency treatments. Also, instead of selecting a few important facts and expressing them in simple, concise style, there is some poorly chosen material. For instance in the chapter on "Food Needs," the author does not show *through what articles of diet* the needs of the body, as presented, may be satisfied; likewise, in the chapter on "Feeding the Sick," and in the one on "The Chemistry of Foods," *no principles of food preparation are stated.* It seems also that more material, not too technical could have been included on *diet* in disease, if this book is to be used by home economics trained home makers.

In the chapters dealing with nutrition, some loose statements, often misleading or confusing are made, such as in Chapter VIII, "a safe, practical rule for the active person in normal health is to eat meat *not over once daily*"; in Chapter IX, "potassium combining with the sodium in such a way as to remove it from the body," and "thyroid, is devoted exclusively to the regulation of iodine metabolism." Similar quotations might be taken from Chapter X.

In spite of these criticisms, *The Family in Health and in Illness* is without question the best book which has been written for use as a textbook for college courses in home care of the sick, and it certainly fills a long felt need in home economics work.

JESSIE ALICE CLINE

Health Education of the Public: A Practical Manual of Technic— *By W. W. Bauer, M.D., and Thomas G. Hull, Ph.D. Philadelphia: Saunders.* 227 pp. Price, $2.50.

"Out of the experiences of many workers there has grown up a formidable mass of knowledge and experience. It is now possible to state with considerable definiteness what are the functions, the purposes, the advantages, the disadvantages of the several media which are available to the health educator." The aim of this text is to expound these potentialities in a field of education, and of health, that has been little understood, little emphasized, and usually poorly taught. Most "health educators," like Topsy, have "jist growed."

The text starts with a chapter on "Definitions and Objectives." This lays the foundation for succeeding chapters on such topics as source of materials, means—for example the radio, exhibits, meetings, pamphlets, newspapers, motion pictures, and other devices and aids to publicity.

Just as the poor teacher under criticism told his high school principal that "he could teach them all night if he could get them to listen," so the major problem of the health educator is to "get them to listen."

This text presents a world of suggestions as to material and methods. It will be of great aid to those responsible for spreading the gospel of health—continually and almost continuously threatened with smothering by the noxious waves of misinformation put out by advertisers through the same media as suggested in this splendid discussion.

It seems to be a case of "fighting fire with fire." Any teacher is faced with three basic questions, upon the proper answering of which the satisfactory solution of his problem depends: whom am I going to teach? What am I going to teach? How am I going to teach? This text places before us the means of answering "what" and "how."

CHARLES H. KEENE

Your Diet and Your Health—*By Morris Fishbein, M.D. New York: McGraw-Hill,* 1937. 298 pp. Price, $2.50.

With his usual clarity and felicity of expression, Dr. Fishbein has written an interesting and instructive book on diet for the general reader. In it he presents in popular language the latest authentic facts about the newer knowledge of nutrition, debunks the weird theories of some of the more blatant faddists, and discusses such pregnant topics as reducing, food sensitivities, and diets in disease conditions, although the last is necessarily somewhat sketchy. Special chapters are devoted to the more important food categories, milk and its products, bread, meat, fish, vegetables, and fruits. An appendix gives valuable data on foods and diets, and there is a good index. This book should serve a useful purpose in helping to inform the public about the essential rôle of diet in the promotion and maintenance of good health. For that purpose it can be highly recommended. JAMES A. TOBEY

New Light on Delinquency and Its Treatment—*By William Healy, M.D., and Augusta F. Bronner, Ph.D. New Haven: Yale University Press,* 1936. 226 pp. Price, $2.00.

Again we are indebted to the authors of this book, for an outstanding contribution to the understanding and treatment of varying problems relative to delinquency.

The basis of this study is a long-term critical analysis of factors making for and against delinquency tendencies and behavior in 105 delinquents compared with 105 children controls belonging to the same family. Of particular interest is a discriminating study of 8 pairs of twins, one of each pair in each instance being a delinquent. The study of this unique material has led the authors to formulate their pivotal conclusion: that the nucleus of delinquent behavior is symptomatic of profound emotional disturbance ingrained by virtue of early life experiences in the life of the delinquent child.

The value of the book is enhanced by the inclusion of representative case material which clearly illustrates various aspects of the problems of delinquency. Of significance is the emphasis which the authors place upon the importance of prevention in delinquency programs. Substance is given to this hope by supplying methodology which

goes with factual material to justify conclusions and generalizations.

The contents are concerned with chapters upon new orientations and the significance of delinquency, introduction to research, the significance of taking the family instead of the delinquent as the unit of research, comparison of emotional experiences of delinquency versus controls, treatment program together with outcomes and new orientation for treatment and their correlations, and, finally, some practical implications of this particular research.

These pioneers and leaders in the field of delinquency have made a most significant contribution in this research which was intended for the Institute of Human Relations of Yale University. Teachers, social workers, juvenile court judges, probation officers, psychiatrists, and all professional lay persons desiring a fundamental grasp of up-to-date conceptions and methodology of delinquency can do no better than to read this timely contribution.

FREDERICK L. PATRY

A Handbook of Accepted Remedies—*Edited by P. J. Hanzlik, M.D. (2nd ed.). San Francisco, Calif.: Department of Public Health. Published by J. W. Stacey, Inc.*, 1937. 115 pp. Price, $1.50.

The first edition of this exceptionally good handbook was rapidly exhausted. The second edition has been brought up to date and maintains the high standard set by the first. A number of new items have been added. Like the first edition, this can be highly recommended in its field.

MAZŸCK P. RAVENEL

Maternal Deaths: The Ways to Prevention—*By Iago Galdston, M.D. New York: Commonwealth Fund*, 1937. 115 pp. Price, $.75 cloth, $.50 paper.

Dr. Galdston has performed a valuable public service in bringing together and reducing to words of one and two syllables the mass of data gathered during recent years on the controversial subject of maternal mortality. He has clothed the subject in non-technical language. Brevity, clarity, and authenticity characterize the book. In this concise form it is readily understandable by the laity. It has a place also in the hands of social workers, nurses, hospital administrators, and all others engaged in public health work.

The book should lead to individual and community action to put an end to the reprehensible maternal morbidity and mortality in this country. The author succinctly states in the foreword that—

> Maternal mortality and morbidity cannot be materially reduced by the efforts of the medical profession alone. The problem must be understood and a solution sought by every individual and every organization interested in public health and in public welfare.

Chapters on the preventable deaths, prenatal care, the attendant at delivery, midwife practice, place of delivery, operative versus spontaneous delivery, Caesarean section, abortion, etc., appear in logical sequence. The concluding chapter on what can be done about it is especially practical and helpful. An appendix is devoted to a consideration of the community organization in Cleveland for obstetrical service in hospitals and the antepartum group instruction to mothers sponsored by the Cleveland Academy of Medicine and the Child Health Association.

RICHARD A. BOLT

Diseases of the Nervous System in Infancy, Childhood and Adolescence—*By Frank R. Ford, M.D. Baltimore: Thomas*, 1937. 953 pp. Price, $8.50.

Fairness to this opus cannot be given by means of an all-inclusive summary.

It has become necessary to consider each portion separately in the form of a chapter review.

In chapter I, three major divisions have been chosen: nervous diseases due to: (1) Congenital origin, including birth injuries and prenatal defects of development; (2) Those of acute onset —chiefly the encephalitides; (3) Insidious, slow onset—heredo-degenerative diseases, chronic infectious processes and most brain tumors, disturbances of the sympathetic-autonomic system, including: sweating, salivation, disturbances of visceral innervation and vasomotor conditions. This chapter ends with a discussion of the advances in the last ten years in the testing of the autonomic system.

The heading of Chapter II, *Clinical Aspects of the Anatomy and Physiology of the Nervous System,* immediately attracts attention. The opening paragraph says that here is something different. The detailed anatomy and development are to be relegated to the proper textbooks. These will be described only as need be to clarify aspects of clinical importance. The embryological development and function of the nervous system is described with the clarifying use of Dr. Meyer's terminology of "segmental apparatus" and "suprasegmental structures."

The ten pages devoted to the anatomical consideration of the arteriovenous system are worth more through condensation than many times more pages in some anatomy texts.

Prenatal Diseases of the Nervous System are conveniently divided in Chapter III. Those due to absence or incomplete formation and those diseases in which the nervous system has developed to a certain point at which there has been a destruction of the nervous tissue. The author endeavors to point out the difficult differentiation between these diseases and the heredo-degenerative diseases; he further elaborates this differentiation in the following chapter. The insidious, progressive nature of the latter is stressed. In distinguishing these he says that generally the evidence of morbid heredity is not nearly so convincing as in the progressive degenerations. The classification offered is based upon defects of anatomical development. Briefly these are: defects due to closure of midline structures (cerebral and spinal cord), absences and defects of centers, neurons, ganglia and hypertrophies.

It should be said that in Chapter V, on *Infections and Parasitic Invasions of the Nervous System,* as throughout the book, can be seen a conservative yet a thoroughly critical view. This can better be judged by reading the compact condensation of the recent and voluminous literature which is presented. One can see in subject after subject the crystalline substance of innumerable authoritative works. It should be emphasized that time and again a topic has been presented as adequately in a short space as could be gotten from laborious search through many journals and texts. This should more than appeal to the physician who wants to know what the disease may be and also wants to know more about it. He will be able to find just that in this book. The author does not agree with certain European writers "that it is justifiable to attribute congenital defects of the nervous system to syphilis, unless there are serological or other evidences of the active disease."

Chapter IX is titled *Injuries of the Nervous System by Physical Agents.* The most important are the birth injuries. Pressure phenomena due to bony malformations are considered. Finally are included the rarer but interesting effects of radium, roentgen rays, lightning and electric shock and intense sunlight. The discussion of cerebral birth injuries is particularly interesting because of the great amount

of the author's personal experience which is represented. Breech deliveries and prematures show especially high incidence for injuries.

In his concluding chapter the author considers clinical findings; he groups the signs in such a way that the etiology is suggested. We find hemiplegias which may be of congenital origin, those caused by birth injuries, acute infectious diseases, primary infections of the brain, neoplasms, degenerative conditions—each one suggestive in view of the history. Muscular atrophies, spasticities, ataxias, involuntary movements, pain and disorders of sensibility, coma, convulsive phenomena, disorders of speech function, nystagmus, disturbance of behavior are all thus discussed in this final chapter. It is a consummating chapter for which the pediatrician and general practitioner have hoped many years.

Finally a word must be said regarding the well chosen, illustrative photographs, charts, tables, and case histories which do much to make the use of this book a pleasure rather than an "I-suppose-I-should" text. Another feature to be recommended is the position of the bibliography; this will be found immediately following the subject under discussion. In this particular matter a short quotation from the preface will better illustrate a consideration which Dr. Ford has shown throughout the book—"Short bibliographies are appended. In the selection of references, I have favored those which are written in English and which are easily available." Little more need be said for an author who has been chosen by Dr. Brennemann to represent the field of neurology in his "Practise of Pediatrics."

W. F. SCHNEIDER

Board Members' Manual—*Prepared by the National Organization for Public Health Nursing, Inc. (2nd ed.) New York: Macmillan,* 1937. 157 pp. Price, $1.50.

Since 1930 when the *Board Members' Manual* was first published, it has been used extensively as a guide for both administrators and board members of voluntary public health nursing agencies. With the increasing importance in the last few years of the nursing services of official agencies there have developed in many localities lay committees whose purpose is to act as interpretive or advisory committees to these services. For such committees this newly revised *Manual* should also be of real help as it describes the best administrative practice of agencies, giving in brief form such information as every committee member should have. The qualifications of public health nurses for various types of positions, methods of support, the organization of new services, the function of committees in official and private agencies, the use of volunteers, relationships with medical and other professional services, personnel policies—these are but some of the many topics discussed.

New committee members will find this a most helpful guide book. Experienced workers to whom the first edition was well known will find fresh material since the book was completely rewritten by the committee. Health officers and nursing administrators will find the brief discussions and carefully assembled information of real value in their work with lay groups. The reviewer congratulates the N.O.P.H.N. and the Manual Committee on the splendid piece of work which they have accomplished.

KATHARINE FAVILLE

Nutrition: Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy. *New York: Col-*

umbia University Press, 1937. 327 pp. Price, $2.00.

Among the most valuable and far-reaching activities of the politically impotent League of Nations have been its studies on human nutrition, several of which have been previously reviewed and highly praised in these columns.

This final report of the committee on nutrition, headed by Viscount Astor and including Drs. E. V. McCollum, E. G. Nourse, and Faith Williams, of the United States, consists in part of a brilliant epitome of what is known today about human nutrition and how this knowledge was developed.

Other parts of the report present able discussions of recent trends in food habits throughout the world, with particular reference to consumption, prices, the relation of income and education to nutrition, and the problem of agricultural adaptation to nutritional requirements.

Numerous recommendations for future progress in the improvement of mundane dietetics are a feature of the report. Further scientific study of nutrition problems is urged, and continuous education of professional groups and the general populace in the principles of the optimum diet is advocated.

The report emphasizes the need for the greater use of protective and energy-bearing foods in the daily diet of all persons, recommending that liberal amounts of milk and dairy products, eggs, meat, green and leafy vegetables, fruit, cod liver oil and other fish liver oils be used, along with bread, wheat cereals, and potatoes. The excessive use of sugar is strongly condemned.

This very well written and attractively printed report should prove of great practical value to all who are concerned in any way with the problem of nutrition and its relation to the health and well-being of the people.

JAMES A. TOBEY

Bacteriology: A Text-Book of Microörganisms — *By Fred Wilbur Tanner (3rd ed., rev.). New York: John Wiley,* 1937. 510 pp. Price, $3.50.

This is a third edition which follows the plan of the previous ones. It is designed for general students of academic subjects. An entire chapter is devoted to the nomenclature and classification of bacteria. We have always thought this was a mistake as the whole subject is very far from having been satisfactorily settled, and much of the material constitutes a useless burden on the minds of the beginner.

There is a great deal of practical information in the book on water bacteriology, sewage treatment, bacteriology of milk and milk products, the use of bacteria in the industrial processes in which fermentation is a feature. The chapter on home canning and industrial preservation of foods is interesting and useful.

The book ends with a Glossary which is useful in some respects, but has mistakes. Professor Tanner has large classes and has evidently found the book of use.

MAZŸCK P. RAVENEL

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Available Data about Sludge as Fertilizer—Dried sludge is a practical source of fertilizer and each sewage works operator should popularize its use by florists, farmers, and gardeners. There is much research needed along this line and agricultural experiment stations might well help. These and much else are the conclusions of the A.P.H.A. Committee on Sewage Disposal.

ANON. Committee Report. The Utilization of Sewage Sludge as Fertilizer. Sewage Works J. 9, 6:861 (Nov.), 1937.

Call for Action—As a result of conferences between committees of the A.P.H.A. and A.M.A., the Board of Trustees of the latter adopted a resolution urging local medical societies to assume leadership in determining the need for both medical and public health services and to develop procedures for meeting these needs.

ANON. Medical Care for All the People. J.A.M.A. 110, 3:212 (Jan. 15), 1938.

Historical Note—Tulare County has its first reported case of tularemia. Looking for plague in 1910, two U. S. Public Health Service Officers ran across a new germ in ground squirrels caught there, which they named *B. tularense,* because of the location. Later, Francis found "deer fly fever" in Utah to be the result of infection with the same germ; hence he named the disease tularemia. Now the chicken has come home to roost.

ANON. Tulare County Has First Tularemia Case. Weekly Bull. California State Dept. of Health. 16, 51:203 (Jan. 15), 1938.

Federal Health Services—Reasons for the establishment of a federal health department are convincingly set forth in this detailed study made by the Bureau of Legal Medicine of the A.M.A. As federal expenditures for health exceed $100,000,000 annually, it would seem logical that the activities be efficiently organized. If you think so, it would be well to write to the listed committee members to tell them so.

ANON. Why a United States Department of Health. J.A.M.A. 110, 4:25B (Jan. 22), 1938.

Nursing Theory and Practice—In theory, the home visit of the public health nurse presents the most promising opportunity to ascertain family health needs and to assist in solving the discovered health problems. The nursing services of three rural counties were reviewed to observe how nearly the nurse's practice approximated these objectives. The conclusion is that the nurses did not render a diversified service in the home visits, so health administrators are invited to examine their nursing programs with a view to attaining these stated objectives.

BEAN, H., and BROCKETT, G. S. The Family as a Unit for Nursing Service. Pub. Health Rep. 52, 53:1923 (Dec. 31), 1937.

Typhus, Rats, Mice, et al.—Endemic typhus is increasing in Southeastern United States. A field mouse trapped in Alabama was found infected with the disease, and it is known that 8 other animals, mostly rodents, are susceptible.

BRIGHAM, G. D., and DYER, R. E. Endemic Typhus Fever in Native Rodents. J.A.M.A. 110, 3:180 (Jan. 15), 1938.

Understanding Youth — Mostly about relating local health services to health education in secondary schools, this paper contains much good for teachers and sanitarians alike.

CONNOLLY, M. P. Sources and Uses of Health Material. J. Health & Phys. Ed. 8, 10:596 (Dec.), 1937, and Pub. Health Nurs. 30, 1:22 (Jan.), 1938.

Latest Word about Colds—Virus from patients with influenza is pathogenic for ferrets and can be cultivated in an aerobic medium, whereas virus from patients with colds does not produce an infection in ferrets and can be cultivated only in an anaerobic medium. Immune substances against the influenza virus have been demonstrated, but as yet, protection against colds has failed to materialize. This paper should be studied well.

DOCHEZ, A. R., *et al.* Filtrable Viruses in Infection of the Upper Respiratory Tract. J.A.M.A. 110, 3:177 (Jan. 15), 1938.

Bending the Twig Re Alcohol—Teaching about alcohol and other drugs should be based upon acquaintance with the essentials of growth and bodily functions, which should precede the presentation of effects upon behavior. Personal choice should be based upon education, not duress. Example is important, for teaching without conviction is unsound. It would be difficult to disagree with this excellent paper.

EMERSON, H. Alcohol and Narcotic Drugs. J. Health & Phys. Ed. 8, 10:588 (Dec.), 1937.

It Depends on the Flea—Of the fleas that transmit plague, the rat flea, *cheopsis*, is the one which does the most damage, but the infection kills the flea as quickly as it does rats and men. Some other varieties of fleas, though they can transmit the disease, do so less easily and themselves survive the infection for longer periods. This seems to account for the slow, smouldering infections in this country which rarely affect humans. An interesting exposition.

ESKEY, C. R. Recent Developments in Our Knowledge of Plague Transmission. Pub. Health Rep. 53, 2:49 (Jan. 14), 1938.

Selling British Health Services—Modestly acknowledging the British health service to be the best in the world, this author points to the fact that less than half the mothers visit antenatal clinics, a third of all infants fail to attend infant welfare centers, and only two-thirds of the school children needing dental treatment get it. This indicates lack of public appreciation of health services, and the outstanding immediate public health objective is to remedy it.

FENTON, J. Knowledge Is the Key to Health. J. Roy. San. Inst. 1, 4:221 (Jan.), 1938.

Credit Where Due—High point of this British paper is the table showing decline in diphtheria deaths in New York contrasted with the continuing high mortality in London. In 50 large British communities, an estimated "immunized" rate of 5 per cent of the total child population is reported.

FORBES, J. G. Progress of Diphtheria Prevention. Brit. M. J., Dec. 18, 1937, p. 1209.

Rheumatic Hearts—If as many cases of polio occurred in any northern city as there are cases of rheumatic heart disease found normally in the hospitals of the same city, what scare headlines we should see! Yet the latter is one of the major public health problems, however apathetic health officials and parents alike may be about it. If the disease were properly reported, both the public and officialdom would be aware of its seriousness, for

it would be exceeded as a cause of death only by tuberculosis, pneumonia, and syphilis, among the communicable diseases.

HEDLEY, O. F. Mortality from Rheumatic Heart Disease in Philadelphia during 1936. Pub. Health Rep. 52, 53:1907 (Dec. 31), 1937.

Negro Health in Large Cities—Illnesses which caused incapacity for at least a week were 43 per cent higher among Negroes than similar groups of white residents in 4 large cities. Among both races improved living status decreased the incidence of illness. Low economic status hence may account for much of the higher Negro disability rate.

HOLLAND, D. F., and PERROTT, G. ST. J. Health of the Negro. Milbank Quart. 16, 1:5 (Jan.), 1938.

Class Differences in Birth Rates—Standardized birth rates were lowest in the $2,000 to $3,000 family income class in this survey conducted in 5 large cities and including 16,831 married women of childbearing age. Higher income families had more children, as did those under $2,000. The reliefers were most prolific. Professional groups do better by the country than the business class. Page Mussolini!

KISER, C. V. Variations in Birth Rates According to Occupational Status, Family Income, and Educational Attainment. Milbank Quart. 16, 1:39 (Jan.), 1938.

What We Know about Polio—This disconcerting review of the many vacant spots in our knowledge of the prevention of poliomyelitis ends with a warning applicable to other public health situations. In effect, the author says that the public should realize how little science knows of the essential facts of poliomyelitis, and should be spared the premature publication of half truths, or no truths.

LANDON, J. F. Poliomyelitis. New York State J. Med. 38, 1:1 (Jan. 1), 1938.

From Jenner to Social Security—An engaging presentation of the development of public health through the protozoan and prevertebrate epochs, the eras of fumigation and environmental sanitation, then the ages of immunization and personal hygiene up to the "homo sapiens" stage.

MILLER, K. E. The Evolution of Public Health. Health Officer. 2, 8:353 (Dec.), 1937.

Public Schools and Health—What is wrong with New York City schools from the standpoint of the health of the school child is likely to be more or less true of other city systems. As the suggested improvements probably apply elsewhere, the paper might well be read by all who have to do with school child health.

ROSENSON, W. Neglected Health Factors in Public Schools. New York State J. Med. 3, 1:7 (Jan. 1), 1938.

Raw Pork Eaters Are Many—Evidence is presented which indicates an incidence of trichinosis among United States adults of about 1 in 5.

SCHEIFLEY, C. H. The Prevalence of Trichinosis. Am. J. Hyg. 27, 1:142 (Jan.), 1938.

Will Influenza Immunization Come?—Evidence is presented of the immunizing properties of influenza vaccines prepared from chick embryo virus cultures. Although protection is afforded by intramuscular injections, it is not known how long the immunity persists.

STOKES, J., JR., *et al.* Vaccination Against Epidemic Influenza with Active Virus of Human Influenza. Am. J. M. Sci., 194, 6:757 (Dec.), 1937.

Health Education in School and Community—Discussed here and in a succeeding issue are the qualifications and training of elementary and secondary school teachers in matters of health,

the nature of training for school health supervision, and the administration of general health education programs.

TURNER, C. E., and RILEY, P. L. The Training of the Health Educator. J. Health & Phys. Ed. 9, 1:13 (Jan.), 1938.

About Abortions—In this typical cross-section of the general population, 15 per cent of all pregnancies were found to terminate in abortion; the rate in rural areas was less, but not greatly different from the urban; about 5 per cent are induced abortions, 10 per cent spontaneous.

WIEHL, D. G. A Summary of Data on Reported Incidence of Abortion. Milbank Quart. 16, 1:80 (Jan.), 1938.

BOOKS RECEIVED

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GRAPHS. HOW TO MAKE AND USE THEM. By Herbert Arkin and Raymond R. Colton. New York: Harper, 1936. 224 pp. Price, $3.00.

THE CONQUEST OF CHOLERA. AMERICA'S GREATEST SCOURGE. By J. S. Chambers. New York: Macmillan, 1938. 366 pp. Price, $4.75.

DISEASE AND THE MAN. By Roger F. Lapham. New York: Oxford University Press, 1937. 143 pp. Price, $2.00.

A TEXTBOOK OF HEMATOLOGY. By William Magner. Philadelphia: Blakiston, 1938. 395 pp. Price, $4.50.

LEGAL MEDICINE AND TOXICOLOGY. By Thomas A. Gonzales, Morgan Vance and Milton Helpern. New York: Appleton-Century, 1937.

DAIRY BACTERIOLOGY. 2d ed. By Bernard W. Hammer. New York: Wiley, 1938. 482 pp. Price, $5.00.

LECTURES ON THE EPIDEMIOLOGY AND CONTROL OF SYPHILIS, TUBERCULOSIS, AND WHOOPING COUGH, AND OTHER ASPECTS OF INFECTIOUS DISEASES. By Thorvald Madsen. Baltimore: Williams & Wilkins, 1937. 216 pp. Price, $3.00.

SCIENCE IN OUR LIVES. By Benjamin C. Gruenberg and Samuel P. Unzicker. Yonkers: World Book Co., 1938. 750 pp. Price, $1.76.

MANUAL OF PSYCHIATRY AND MENTAL HYGIENE. 7th ed. By Aaron J. Rosanoff. New York: Wiley, 1938. 1091 pp. Price, $7.50.

THE FIGHT FOR LIFE. By Paul de Kruif. New York: Harcourt Brace, 1938. 342 pp. Price, $3.00.

DAS LEBEN DER FRAU. By Bruno Gebhard. Stuttgart: Union Deutsche Verlagsgesellschaft Stuttgart, 1937, 231 pp. Price, $5.00.

FIFTH AVENUE TO FARM. A Biological Approach to the Problem of the Survival of Our Civilization. By Frank Fritts and Ralph W. Gwinn. New York: Harper, 1938. 282 pp. Price, $3.00.

THE FOUNDATIONS OF NUTRITION. By Mary Swartz Rose. New York: Macmillan, 1938. 625 pp. Price, $3.50.

REPORT ON THE BRITISH HEALTH SERVICES. By the Health Group of P E P. London: P E P, 1937. 430 pp. Price, $3.00.

GOOD HOUSKEEPING AND SAFETY IN THE FOUNDRY INDUSTRIAL CODES AND OCCUPATIONAL DISEASE LEGISLATION. Chicago: American Foundrymen's Assoc., 1937. 61 pp. Price, $1.50.

REPORT ON EIGHTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, BRUSSELS, BELGIUM, JUNE 27–JULY 3, 1935. Report of Captain William Seaman Bainbridge. Washington: Government Printing Office, 1937. 114 pp. Price, $1.00.

THE ART AND SCIENCE OF MARRIAGE. By Esther B. Tietz and Charles K. Weichert. New York: McGraw-Hill, 1938. 279 pp. Price, $2.50.

THE EXPECTANT FATHER'S HANDBOOK. By David Victor. Indianapolis: Bobbs Merrill, 1938. 170 pp. Price, $1.50.

WE AND OUR NEIGHBORS. A Welfare Primer. By Buffalo Council of Social Agencies. New York: Community Chests and Councils, 1937. 84 pp. Price, $.75.

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A CENTURY OF BOOK PUBLISHING, 1838-1938. By John Barnes Pratt. New York: Barnes, 1938. 56 pp.

THE BIOLOGY OF PNEUMOCOCCUS. By Benjamin White. New York: Commonwealth Fund, 1938. 799 pp. Price, $4.50.

ORGANIZING THE COMMUNITY FOR DELINQUENCY PREVENTION. New York: Community Chests and Councils, 1937. 27 pp. Price, $.50.

ASSOCIATION NEWS

Officers and Executive Committee
Kansas City Annual Meeting

DR. Edwin Henry Schorer, Chairman of the Local Committee on Arrangements for the Sixty-seventh Annual Meeting of the Association, to be held in Kansas City, Mo., October 25–28, announces the following appointments of officers and chairmen of sub-committees working for the success of the convention:

Honorable Bryce B. Smith.....Honorary Chairman
Mayor of Kansas City, Mo.
Honorable Don. C. McCombs.....Honorary Chairman
Mayor of Kansas City, Kans.
Edwin Henry Schorer, M.D.....Local Chairman
Director of Health, Kansas City, Mo.
Ralph Duncan, M.D.....Vice-Chairman
Commissioner of Laboratories, Health Department
Otto Murphy.....Vice-Chairman
Commissioner of Inspection & Sanitation
Albert Jewell.....Secretary
Health Conservation Association
William F. Lunsford, M.D.....Treasurer
Director of Health, Kansas City, Kans.
Merl P. Moon, Ph.D.....
President-Elect, Missouri Public Health Association

Chairmen

Edward H. Skinner, M.D.....Finance Committee
Jackson County Medical Society
Ira H. Lockwood, M.D.....Reception Committee
President, Jackson County Medical Society
Morris Ginsberg, M.D.....Publicity Committee
Health Conservation Association
Carl Ferris, M.D.....Radio Committee
Jackson County Medical Society
Max Goldman, M.D.....Meeting Rooms Committee
Jackson County Medical Society
H. E. Boning, Jr.....Registration Committee
Manager, Convention Bureau
E. L. Filby.....Scientific Trips Committee
Associate Engineer, Black & Veatch
Frank Houston.....Entertainment Committee
Account Executive, Potts Advertising Company
Mrs. Samuel Sawyer.....Ladies Entertainment Committee
President, Visiting Nurses Association
John Williams, Jr., M.D.....Membership and Attendance Committee
Missouri State Board of Health
E. K. Musson, M.D.....Membership and Attendance Committee
Kansas State Board of Health
Edward A. Plowman.....Transportation Committee
Supt., Motor Section, Health Department
Ralph E. Duncan, M.D.....Housing Committee
Commissioner of Laboratories, Health Department
Otto Murphy.....Scientific Exhibits Committee
Commissioner of Inspection and Sanitation,
Health Department

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

George M. Brother, M.D., 204 S. High St., Rising Sun, Ind., Director, Fourth District Health Dept.

William W. Fuller, M.D., Health Department, Christiansburg, Va., Montgomery County Health Officer

Elsworth L. Gardner, M.D., Courthouse, Eugene, Ore., City and County Health Officer

Abraham Gelperin, M.D., 306 Northern Ave., Cincinnati, O., District Physician, Dept. of Health

Edgar M. Griffith, M.D., Harrisonville, Mo., Director, Cass County Public Health Unit

F. Sydney Hansen, M.D., City Hall, Pendleton, Ore., County Health Officer

Joseph L. Hundley, M.D., Wytheville, Va., Wythe County Health Officer

James Murphy, M.D., 101 Broad St., Middleton, Conn., President, City Health Board

Samuel B. Osgood, M.D., County Court House, Grants Pass, Ore., Josephine County Health Officer

J. A. Outland, M.D., Murray, Ky., Calloway County Health Officer

Vincenzo Pascale, M.D., 38 W. 10 St., New York, N. Y., Medical Inspector and Chief, Bureau of Social Hygiene, Staten Island Case Finding Project, New York City Dept. of Health

C. L. Putnam, M.D., State Dept. of Health, Des Moines, Ia., Field Representative and Medical Director, District No. 111

Frederick M. Rauch, M.D., Mohegan Lake, N. Y., Health Officer, Putnam Valley

William C. Treder, M.D., 138 Mohawk Ave., Scotia, N. Y., Commissioner of Health, Schenectady

James P. Ward, M.D., Charleston, Miss., Director, Tallahatchie County Health Dept.

Jabez H. Williams, M.D., Clinton, N. C., Sampson County Health Officer

Laboratory Section

Frieda Canvel, 10434 Hebron Lane, West Los Angeles, Calif., Bacteriologist, Grade 1, Los Angeles County Health Dept.

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Rowland A. Grote, 807 E. 30 St., Austin, Tex., Pharmacist, Bureau of Laboratories, State Dept. of Health

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Blanche Kosecoff, Dept. of Health Laboratories, Ft. of E. 16 St., New York, N. Y., Laboratory Assistant

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William H. Zimmermann, 1972 E. 33 St., Brooklyn, N. Y., Acting Supervisor in Charge of City Milk Inspection, Dept. of Health

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Lavinia Baskin, R.N., Moncks Corner, S. C., County Nurse, Berkeley County Health Dept.

Elma Bergey, Frankfort, Mich., County Nurse, Benzie County Children's Fund of Michigan

Evelyn Buck, R.N., Department of Health, Detroit, Mich., Supervisor, Division of Child Welfare Nursing

Margaret V. Bynum, 1213½ W. Adams, Phoenix, Ariz., Public Health Nurse, Maricopa County Health Unit

Beulah R. Daniel, R.N., Box 271, Perry, Ga., District Advisory Nurse, State Board of Health

Lois M. Enright, 528 W. 111 St., New York, N. Y., Staff Nurse, Henry Street Visiting Nurse Service

Helen Fisher, 1307 S. W. Broadway, Portland, Ore., Supervisor of School Nurses, Bureau of Health

Wealtha M. Goode, R.N., 340 W. Second, El Dorado, Ark., Public Health Nurse, Union County Health Dept.

Margaret Goodman, 1027 E. Palm Lane, Phoenix, Ariz., School Nurse, Maricopa County Health Unit

Clarice M. Harper, R.N., Box 1201, Buckeye, Ariz., Staff Nurse, Maricopa County Health Unit

Juanita Johnston, R.N., 614 W. 3rd, Albany, Ore., Albany School Nursing, Director of Health Education

Marie Kass, R.N., 692 Wisconsin St., San Francisco, Calif., Field Nurse, Dept. of Public Health

Florence R. Laird, 2530 N. 8 St., Phoenix, Ariz., Nurse, Maricopa County Health Unit

Florence Manley, R.N., 199 Hodge Ave., Buffalo, N. Y., District State Supervising Nurse, State Dept. of Health

Dorothy Somerville, R.N., Kings County Schools, Hanford, Calif., Supervisor of Child Health and Welfare

Hazel I. Stewart, Almond, N. Y., District Supervising Public Health Nurse, State Dept. of Health

Lillian E. Upham, 411 Court House, Flint, Mich., Supervising Nurse, Genesee County Health Dept.

Clara Valenzuela, 610 N. 3 St., Phoenix, Ariz., Public Health Nurse, Maricopa County Health Unit

Elizabeth Vanden-Bossche, Betsy Barbour House, Ann Arbor, Mich., Student

Una V. Wetherby, 11 E. Newton, Boston, Mass., Public Health Nursing Supervisor, State Dept. of Public Health

Dorothy L. Wise, 294 Washington St., Geneva, N. Y., District State Supervising Nurse, State Dept. of Health

Epidemiology Section

Maurice J. Ansfield, M.D., 238 W. Wisconsin Ave., Milwaukee, Wis., Clinic Physician, Bureau of Communicable Diseases, City Health Dept.

Alfreda Arreaza-Guzman, M.D., 615 N. Wolfe St., Baltimore, Md., Student on leave (Epidemiologist, Ministerio de Sanidad y Assistencia Social, Caracas, Venezuela, S. A.

Kenneth F. Brandon, M.D., City Hall, Vancouver, B. C., Canada, Director, Health Unit No. 3, Metropolitan Health Board

Warren W. Lacey, Jr., M.D., 818 E. 40 St., Brooklyn, N. Y., Epidemiologist-in-training, State Dept. of Health

Lester G. Levingson, 615 N. Wolfe St., Baltimore, Md., Student

Moses Silverman, M.D., 702–54 St., Brooklyn, N. Y., Physician in Charge Syphilis Clinic Red Hook Station, Dept. of Health

Unaffiliated

Daniel P. McMahon, M.D., State Dept. of Health, Albany, N. Y., Epidemiologist-in-training

Grover C. Sherrard, M.D., U. S. Quarantine Station, Rosebank, S. I., N. Y., Physician, U. S. Public Health Service

Morris S. Wiener, D.D.S., 1284 St. Johns Pl., Brooklyn, N. Y., Interested in Oral Health Promotion

DECEASED MEMBERS

George P. Barth, M.D., Milwaukee, Wis., Elected Member 1918, Fellow 1928

Lawrason Brown, M.D., Saranac Lake, N. Y., Elected Member 1915, Fellow 1923, Life Member 1929

Charles H. Lawall, Sc.D., Philadelphia, Pa., Elected Member 1914, Fellow 1922

George H. Roth, M.D., Los Angeles, Calif., Elected Member 1920, Fellow 1933

L. J. Zoeller, Ivorydale, O., Elected Member 1930, Fellow 1934

Prof. Theodore J. Bradley, Boston, Mass. Elected Member 1920

William C. Buntin, M.D., Staten Island, N. Y., Elected Member 1936

Marion A. Gleason, M.D., Providence, R. I., Elected Member 1924

Charles H. Hood, D.Sc., Boston, Mass., Elected Member 1913

Charles E. Kaufman, M.D., West Haven, Conn., Elected Member 1935

Charles D. Kline, M.D., Nyack, N. Y., Elected Member 1919

August G. Nolte, Jefferson City, Mo., Elected Member 1937

Gus H. Radebaugh, Urbana, Ill., Elected Member 1933

T. H. Rockwell, M.D., New York, N. Y., Elected Member 1916

DeWitt T. Smith, M.D., Dallas, Tex., Elected Member 1926

Jason Waterman, Washington, D. C., Elected Member 1935

Ada B. Coffey, R.N., New York, N. Y., Elected Member 1931

Henry A. Rowland, Toronto, Ont., Elected Member 1920

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITION AVAILABLE

LOS ANGELES COUNTY CIVIL SERVICE COMMISSION

Assistant Health Officer, Health Department. Open to residents of the United States. Men only. M.D. and possess or able to secure certificate to practise in California; possess certificate or degree in public health from recognized school of public health in the United States; 2 years' recent experience in public health work in administrative capacity. Five years' additional experience may be substituted for public health certificate or degree lacking. Vacancies: One. Age: At least 30 years at date of examination. Salary starts at $450 per month. (Examination given in Los Angeles only.) Applications must be filed by April 15, 1938.

POSITIONS WANTED

HEALTH OFFICERS

Physician, M.D., University of Maryland; C.P.H., Johns Hopkins; broad experience in county public health administration, will consider opening of better class. **A346**

Physician, M.D., Western Reserve; short course for health officers, Johns Hopkins; with county and state experience, wishes administrative or epidemiological position; north or west preferred. **A349**

Physician, M.D., Northwestern University; Dr.P.H., Yale; will consider appointment in general administration, infant welfare or epidemiology. **A300**

Experienced physician, administrator, epidemiologist and teacher, now employed, with C.P.H. from Johns Hopkins and 14 years public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. **A355**

Experienced Health Officer, who has completed Vanderbilt short course, 1936, will consider appointment. West preferred. **A320**

Physician, M.D., Johns Hopkins; Public Health course at Michigan; experienced in school and city health work, will consider an administrative post in eastern United States. **A354**

Physician; age 33, M.D., University of Wisconsin; M.P.H., Harvard; specializing in industrial hygiene, will consider general administration. **A342**

Trained administrator, A.B., M.D., with background of laboratory and research; formerly Assistant Health Commissioner large city. Familiar with all lines. Available short notice. **A295**

CHILD HYGIENE

Experienced physician, M.D. and Ph.D., University of Minnesota; specially qualified in maternal and child hygiene, directing state and local programs; will consider position of better sort. **A238**

Woman physician, M.D., Creighton Medical School, with extensive experience in maternal, infant and child hygiene, and special interest in crippled children's service, desires position in field work. **C301**

Woman physician, M.D., Rush Medical; wishes administrative or clinical position in maternal and child health. **C347**

Woman physician, M.D., Yale; Dr.P.H., Yale; experienced in pediatrics and administration of state bureau, will consider attractive opening. **C348**

SANITARY ENGINEERING

Sanitary Engineer, courses at Rutgers University, with 17 years' experience in design, research and construction of water and sewage plants, as well as aerial pollution surveys, desires position, preferably research. **E321**

Graduate Sanitary Engineer with service under U.S.P.H.S. and State Departments of Health, especially interested in filtration plant design and operation and shellfish sanitation, seeks employment. **E356**

MISCELLANEOUS

Young woman, M.S.P.H., University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. **M303**

Young man, at present college teacher of hygiene and physical education and experienced in university medical service, desires position as executive in public or private health organization. **M357**

NEWS FROM THE FIELD

MODEL ORDINANCES

THE A.P.H.A. Information Service frequently receives requests from health officers and others asking for information about model ordinances on a great variety of subjects. In the absence of any comprehensive publication on model ordinances, the Information Service is thrown back on those cities and other municipalities which have advised the Association of regulations proved to be satisfactory.

The Information Service would welcome receipt of copies from any health officer who has ordinances of merit which he would recommend for the consideration of other areas. Address the Executive Secretary, American Public Health Association, 50 West 50th Street, New York, N. Y.

UNIVERSITY OF MINNESOTA IN-SERVICE FELLOWSHIPS IN PUBLIC ADMINISTRATION

THE University of Minnesota offers a limited number of in-service fellowships in public administration for the academic year 1938–1939. These are available to promising young men and women now in the service of government in order that they may better equip themselves to fill positions involving administrative leadership and responsibility. It is also the aim to encourage governmental bodies to give recognition to these persons in making promotions to administrative posts.

Applicants must be citizens of the United States, not over 35 years of age, graduates of recognized universities and colleges, and must qualify for admission to the graduate school at the University of Minnesota. They must have had not less than three years of experience in public service, preferably in a position involving some administrative responsibility. Each applicant for an in-service fellowship must be endorsed by his governmental employer. Credit earned in residence at the University during the training period may be applied toward advanced degrees. Applications are to be submitted not later than April 1, 1938, and appointments will be announced May 15 or as soon thereafter as possible. Requests for application blanks and for further information should be addressed to the Secretary of the Committee on Training for Public Health Administration, 13 University Library, University of Minnesota, Minneapolis, Minn.

TUBERCULOSIS RULING

GEORGE C. Ruhland, M.D., of Washington, D. C., Health Officer of the District of Columbia, has reported a test case of the right of the Health Department of the District of Columbia to prevent a man from spreading tuberculosis to his children and other persons in the community. The Police Court ruled that the tuberculous patient could take his choice of paying a fine or receiving treatment in a sanatorium. A summary of the case follows: The patient was 73 years old, a night watchman. He had a wife 30 years old and 4 children ranging from 8 months to 9 years of age. A private physician reported the man to have tuberculosis in July, 1936. He failed to keep appointments at the clinic, and refused admittance to visiting nurses. He refused to have his children examined. On January 13, 1938, the Police Court ruled that Solomon Bell violated the laws of the District of Columbia relating to the prevention of tuberculosis.

DR. COGSWELL HONORED

DR. W. F. Cogswell, Montana's State Health Officer for the past 25 years, was honored at a Silver Anniversary banquet given by members and employees of the State Board of Health on January 17, in Helena. More than 80 persons were present, and 50 messages of greeting and congratulation were received by Dr. Cogswell.

Dr. Cogswell was first named Secretary of the Montana State Board of Health in 1912. In that year he was also Secretary of the Montana Public Health Association. When the State Board of Entomology was created in 1913, he was named chairman, and it was largely through his efforts that, in 1923, the Rocky Mountain Tick Laboratory for the study of spotted fever was established in Hamilton, Mont., and, in 1931, transferred to the U. S. Public Health Service.

In 1920, he was president of the State and Provincial Health Officers of North America, and in 1936, he was president of the Western Branch of the American Public Health Association.

Among the many letters received were those from Dr. Thomas Parran, Surgeon-General, and Dr. A. T. McCormack, President of the A.P.H.A. Another letter was from Joseph Brown, chairman of the Blackfeet Tribal Council, extending greetings to their "Chief Little Bull," Dr. Cogswell's tribal name.

VENEREAL DISEASE COURSE

A ONE-WEEK refresher course in venereal disease control is being offered at Western Reserve University, Cleveland, Ohio, open to any regularly licensed physician in Ohio, without fees.

This is a shortening of the graduate course recently announced as planned to cover 3 or 4 months. The short course will consist of formal lectures on the several venereal diseases and demonstrations of methods of examination and treatment.

Further information and a copy of the working schedule may be obtained from George W. Binkley, M.D., 2085 Adelbert Road, S.E., Cleveland.

CANADIAN PUBLIC HEALTH ASSOCIATION MEETING

THE next annual meeting of the Canadian Public Health Association will be held in Halifax, N. S., from June 20–22, 1938.

The Lord Nelson Hotel will be the convention headquarters.

TRANSACTIONS OF THE CONGRESS ON HYGIENE

THE State Health Department of Maryland has a limited number of the Transactions of the Fifteenth International Congress on Hygiene and Demography meeting in 1912, which it will be glad to distribute without cost to any physician, public health official, or library, desiring a set. The set consists of 6 volumes dealing with the following subjects.

Volume I, Part I.—Organization and Membership. Part II.—Proceedings of the Joint Sessions and General Index. *Volume II*, Part I.—Hygienic Microbiology and Parasitology. Part II.—Dietetic Hygiene; Hygienic Physiology. *Volume III*, Part I.—Hygiene of Infancy and Childhood; School Hygiene. Part II.—Hygiene of Occupations. *Volume IV*, Part I.—Control of Infectious Diseases. Part II.—State and Municipal Hygiene. *Volume V*, Part I.—Hygiene of Traffic and Transportation. Part II.—Military, Naval, and Tropical Hygiene. *Volume* VI.—Demography.

Applications should be sent to Dr. Robert H. Riley, Director, State of Maryland Department of Health, 2411 North Charles Street, Baltimore, Md. The sets will be sent with express charges collect.

CANADIAN PUBLIC HEALTH ASSOCIATION ADOPTS STANDARD METHODS

ON the recommendation of the Section, the Canadian Public Health Association has adopted officially the Standard Methods for the Examination of Water and Sewage, as prepared by the American Public Health Association and the American Water Works Association, subject to the incorporation of such alternative methods as may be deemed necessary.—The Sixth Annual Christmas Meeting of the Laboratory Section of the Canadian Public Health Association, 1938. *Canad. Pub. Health J.*, Jan., 1938.

REGIONAL LABORATORIES

UNDER the provisions of the Bankhead-Jones Act, three new regional laboratories for the investigation of regional problems in agriculture were approved during the fiscal year ended June 30, 1937. The new regional laboratories include one for the study of animal parasites in the southeast, one for the development of swine breeding in the north central states, and one for sheep improvement in the range states.

The laboratory for the study of diseases and parasites of domestic animals is being established at the Alabama Polytechnic Institute, at Auburn. The experiment stations of 13 southeastern states are coöperating with the U. S. Department of Agriculture in the development of the program for regional studies, which will be under way in all the states with headquarters and coordinating direction at Auburn. The states are: Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee, Kentucky, and Oklahoma.

Regional research has been made possible by appropriations under the Bankhead-Jones Act, which, unlike previous legislation for the support of experiment stations, require state appropriations to offset the federal contributions. Each state complied with this requirement and, on the average, state appropriations were several times the amount required under this provision.—*J. Am. Vet. Med. Assoc.*, Feb., 1938.

NORTH CAROLINA SYPHILIS CAMPAIGN

ACCORDING to the *Journal of the American Medical Association*, the Zachary Smith Reynolds Foundation is devoting the entire income from its funds, amounting to $7,000,000, to finance a campaign against syphilis in North Carolina. The income is stated to be more than $100,000 a year, and this amount has already been presented to the State Board of Health for the first year's work.

The State is now operating 67 clinics for venereal disease and the new fund will be used to expand about 12 of these in the more populous counties. For rural districts a clinic on wheels, consisting of a motor truck fitted as a physician's office and accompanied by a doctor and a nurse, will be developed as one of the first projects.

The plans are under the direction of Carl V. Reynolds, M.D.,† of Raleigh, the State Health Officer.

MARYLAND SUMMER CAMPS

OWNERS and operators of summer camps in Maryland—tourist, recreational, and labor—have been notified by R. H. Riley, M.D.,* Director of the State Department of Health, that all camps in Maryland must be inspected and duly licensed before they may be opened for visitors. Permits do not hold over from year to year. Whether the camps are old or new, permits must be secured for the coming season. No camp may be operated without one.

* Fellow A.P.H.A.
† Member A.P.H.A.

The regulations apply to every camp or picnic ground that is used for a period of 6 days or longer.

PARENTS' MAGAZINE AWARDS

SURGEON General Thomas Parran's crusade against venereal disease and Ireene Wicker's 8 years of broadcasting as The Singing Lady receive this year's awards for outstanding service to children given by *The Parents' Magazine*. The announcement is made in the March issue of the magazine.

In previous years only one award was made. Other winners were: Walt Disney, 1934; Grace Abbott, 1935; Walter Damrosch, 1936; Dr. Allan Roy Dafoe, 1937.

NURSES' BIENNIAL CONVENTION

THE Biennial Convention of the 3 national nursing organizations—the American Nurses' Association, the National League of Nursing Education, and the National Organization for Public Health Nursing—will be held in Kansas City, Mo., April 24–29. The Hotel President will be the convention headquarters.

The central theme of the Biennial will be "The Individual Nurse's Responsibility for Professional Progress."

NEW YORK HEALTH DEPARTMENT NURSING IN 1937

MEMBERS of the New York City Health Department Nursing staff made over 600,000 visits in 1937, according to the February issue of *Our Nurses*, issued February 5.

Of the total 600,000 visits, about 100,000 were made to infants and preschool children, 280,000 to homes of school children, 110,000 to homes of tuberculous patients, and 6,000 to cases of acute contagion.

PERSONALS

Central States

DR. LOUIS P. H. BAHRENBURG, Director of the U. S. Marine Hospital of the U. S. Public Health Service, at Cleveland, Ohio, has retired. He is succeeded by DR. FRANK M. FAGET, Senior Surgeon in the Service, who has been at the Marine Hospital in Louisville, Ky.

DANIEL C. BARRETT, M.D., C.P.H.,† has become Director of the Washington County Health Unit, Iowa. Dr. Barrett was formerly District Physician for the Cincinnati, Ohio, Health Department.

FRANCIS B. CARROLL, M.D., C.P.H.,† of Paw Paw, Mich., has resigned as Director of the Van Buren County Health Department to join the Division of Communicable Diseases of the Massachusetts Department of Health, Boston, Mass.

DR. FRED A. DENNIS, of Crawfordsville, Ind., has been appointed Health Officer of Montgomery County, succeeding DR. JAMES S. NOBLITT, of Waveland.

DR. JOHN C. GLACKMAN, of Rockport, Ind., has been appointed Health Officer of Spencer County.

ALFRED G. LONG, M.D., C.P.H.,* of Kokomo, Ind., has been appointed Health Officer of the City of Miami Beach, Fla.

MRS. BLANCHE R. MILLER, of Cincinnati, Ohio, has been appointed Supervisor of Health Education of Cincinnati, a newly created position. Mrs. Miller will develop a program of health education in the schools and the community in the campaign against tuberculosis.

JOSEPH G. MOLNER, M.D., C.P.H.,† and FRANKLIN H. TOP, M.D., C.P.H.,† both of Detroit, will divide the responsibilities of the position

* Fellow A.P.H.A.
† Member A.P.H.A.

of Deputy Health Commissioner of Detroit, Mich., succeeding DON W. GUDAKUNST, M.D.,* who recently resigned to become State Health Commissioner.

DR. IRA E. PERRY, of North Manchester, Ind., has been appointed Health Officer of Wabash County, succeeding DR. ARTHUR J. STEFFEN, of Wabash.

DR. CARL M. PORTER, of Jasonville, Ind., has been appointed Health Officer of Greene County, Ind.

DR. CHARLES L. WISE, of Camden, Ind., has been appointed Health Officer of Carroll County, succeeding DR. ALBERT C. CLAUSER, of Delphi.

Eastern States

I. HOPE ALEXANDER, M.D.,† has been reappointed Director of Health of Pittsburgh, Pa.

FRANK A. CALDERONE, M.D., C.P.H.,† of Jericho Turnpike, Westbury, N. Y., is leaving the service of the State of New York and entering that of the City as District Health Officer of the Lower East Side Health Office, at 73 Cannon Street, New York, N. Y.

DR. ARTHUR J. COUTURE, of Moosup, Conn., has been appointed Health Officer of Sterling, for 4 years.

H. JACKSON DAVIS, M.D., DR.P.H.,* Assistant Director of Local Health Administration, New York State Department of Health, Albany N. Y., has become Chief Medical Officer on the staff of the State Department of Social Welfare. In addition to regular and special assignments in the department, Dr. Davis was Director of Medical Care for TERA until June 30, 1937; during the preceding 5 years he was responsible for the distribution of more than $10,000,000 in medical relief in the state. He has also been responsible for administrating details of 44 TERA "work relief projects" employing needy physicians, dentists, nurses, and other public health personnel. In addition to his assignment as TERA Director of Medical Care, Dr. Davis served as WPA Consultant on Medical Care for upstate New York soon after it was organized in 1935.

ROBERT D. JOHNSON, M.D., has been appointed Director of the Bureau of Tuberculosis in the Department of Health of Syracuse, N. Y., succeeding HENRY BURTON DOUST, M.D.

DR. CHARLES A. KRAUS, Professor of Chemistry and director of chemical research at Brown University, Providence, R. I., has been elected President of the American Chemical Society for 1939. DEAN FRANK C. WHITMORE, of Pennsylvania State College, State College, Pa., is President for 1938.

DR. JAMES H. LADE, who recently completed a fellowship in syphilis at Johns Hopkins Hospital, has been appointed Medical Consultant in the Division of Syphilis Control, New York State Department of Health.

DR. GEORGE S. LAMBERT has been appointed Health Officer in the Borough of Danielson, and Acting Health Officer of Killingly, Conn.

GOODHUE LIVINGSTON, JR., of New York, N. Y., has been sworn in as Secretary of the New York City Health Department.

GREGORY D. MAHAR, M.D.,† Commissioner of Health of Syracuse, N. Y., has returned at his own request to his former position as Senior Epidemiologist in the Syracuse Health Department.

ELEANOR W. MUMFORD, R.N., formerly Assistant Director of the National Organization for Public Health Nursing, has been appointed Associate for Nursing Activities by

* Fellow A.P.H.A.
† Member A.P.H.A.

the National Society for the Prevention of Blindness, succeeding FRANCIA BAIRD CROCKER, R.N.

MAURICE G. POSTLEY,† formerly Secretary of the New York City Health Department, has been appointed Secretary of the New York City Board of Education.

Southern States

DR. JAMES H. BUNN, JR., formerly of Henderson, has been appointed head of a new health unit in Johnston County, with headquarters in Smithfield, N. C.

DR. CHARLES F. ENGELKING has been reappointed Health Commissioner of Dalton and Whitfield County, Ga.

W. S. LEATHERS, M.D.,* Dean of the School of Medicine, Vanderbilt University, Nashville, Tenn., received the Doctorate of Humane Letters from Tulane University, New Orleans, La., on the occasion of the installation of DR. RUFUS C. HARRIS as President. The same degree was awarded REV. ALPHONSE M. SCHWITALLA, PH.D., S.J.,† Dean of the School of Medicine, St. Louis University, St. Louis, Mo.

DR. FRANCIS F. SCHWENTKER resigned as Director of Medical Research in the Baltimore City Health Department January 1, to study scarlet fever in Rumania under the auspices of the Rockefeller Foundation.

DR. LOREN WALLIN, formerly of Sparta, Ga., has been appointed Health Officer of Anson County, N. C., a new health unit.

Western States

DR. PAUL R. ENSIGN, formerly of Butte, Mont., has been appointed Pediatrician to a child health demonstration in Hancock-Glascock Counties, Ga.

SAMUEL WEISSROSS, M.D.,† of Boise, Assistant Director of Public Health, of the Idaho State Department of Public Welfare, has taken charge of industrial hygiene activities and of medical statistics.

Canada

ADELARD GROULX, M.D., C.P.H., of Montreal, Quebec, has been appointed Director of the Department of Health of the City of Montreal, succeeding SERAPHIN BOUCHER, M.D.,* retired.

DEATHS

GEORGE HENRY FALKINER NUTTALL, M.D., F.R.S., died suddenly in England, at the age of 75. He was born in San Francisco. He received his medical training in the University of California, Johns Hopkins, and Göttingen. He was assistant to Dr. William H. Welch at Johns Hopkins University in 1890, and later became Associate in Hygiene. He taught bacteriology and preventive medicine in Cambridge, and in 1895 became Reader in Hygiene. He was appointed Quick Professor of Biology, and was elected a professorial Fellow of Magdalene College. His researches are incorporated in more than 200 unpublished papers, and cover bacteriology, serology, hygiene, tropical medicine, and parasitology. His most important discovery was the bactericidal property of the blood serum and other body fluids, which is credited as the pioneer work in immunology.

ETHEL M. HANSON, for 20 years Director of the Health and Parent Education Association of Cleveland, Ohio, died recently.

W. F. ROBERTS,† Minister of Health and Labor for New Brunswick and the first Minister of Health in the British Empire, died at Saint John, N. B., February 10, at the age of 68.

JOHN N. RYAN, M.D.,† Health Officer of Passaic, N. J., for 26 years, died February 10.

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* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Academy of Tuberculosis Physicians. San Francisco, Calif. June 13–14.

American Association of Medical Social Workers. Seattle, Wash. June 26–July 2.

American Association of Pathologists and Bacteriologists. Atlantic City, N. J. May 3–4.

American Association of Psychiatric Social Workers. Seattle, Wash. June 26–July 2.

American Association of Schools of Social Work—Joint Meeting with American Association of Social Workers, and National Conference of Social Workers. Seattle, Wash. June 26–July 2.

American Association of Social Workers —Joint Meeting with American Association of Schools of Social Work, and National Conference of Social Workers. Seattle, Wash. June 26–July 2.

American Chemical Society. Dallas, Tex. April 18–21.

American College of Physicians, Waldorf-Astoria Hotel, New York, N. Y. April 4–8.

American Dental Association. St. Louis, Mo. October.

American Dietetic Association—21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9–14.

American Home Economics Association—31st Annual Meeting. William Penn Hotel, Pittsburgh, Pa. June 28–July 1.

American Hospital Association. Dallas, Tex. September 26–30.

American Institute of Nutrition: Johns Hopkins University—School of Hygiene and Public Health. Southern Hotel, Baltimore, Md. March 30.

American Medical Association. San Francisco, Calif., June 13–17.

American Nurses Association. Hotel President, Kansas City, Mo. April 24–29.

American Public Health Association — 67th Annual Meeting. Hotel Muehlebach, Kansas City, Mo. October 25–28.

American Public Welfare Association —Joint Meeting with National Conference of Social Workers. Seattle, Wash. June 26–July 2.

American Society of Clinical Pathologists. San Francisco, Calif. June 9–11.

American Veterinary Medical Association. New York, N. Y. July 5–9.

American Water Works Association—Annual Meeting. Hotel Roosevelt, New Orleans, La. April 24–28.

American Water Works Association:

New York Section. Hotel Jamestown, Jamestown, N. Y. March 17–18.

Kentucky Section. Brown Hotel, Louisville, Ky. March 21–23.

Canadian Section. Prince Edward Hotel, Windsor, Ont. March 23–25.

Illinois Section. Orlando Hotel, Decatur, Ill. April 5–6.

Indiana Section. Purdue Union Building, West Lafayette, Ind. April 7–8.

Montana Section. Baxter Hotel, Bozeman, Mont. May 13–14.

Pacific-Northwest Section. Davenport Hotel, Spokane, Wash. May 19–21.

Florida Section. Daytona Beach, Fla. May 23–25.

New Jersey Section. Hackensack Water Company Plant, New Milford, N. J. May 25.

Association for the Study of Allergy. San Francisco, Calif. June 13–14.

Association for the Study of Internal Secretions. San Francisco, Calif. June 13–14.

Association of Foods and Drug Officials of South Central States. Biloxi, Miss. May.

Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13–15.

Building Officials Conference of America. Washington, D. C. March 23–25.

California Association of Health, Physical Education and Recreation. Pasadena, Calif. April 18–19.

California Conference of Social Work. Pasadena, Calif. April 24–28.

California Medical Association. Pasadena, Calif. May 9–12.

Central Physical Education Association. Minneapolis, Minn. March 30–April 2.

Conference of State and Provincial Health Authorities of North America. Washington, D. C. April 9–12.

Congress of American Physicians and Surgeons. Atlantic City, N. J. May 2–6.

Congress of Parent-Teachers Association. Battle Creek, Mich. April 20–22.

Dairy Products Association of the Northwest. St. Paul, Minn. April.

Federation of American Societies for Experimental Biology. Baltimore, Md. March 30–April 2.

Georgia Public Health Association. Atlanta, Ga. May.

Governmental Research Association. Princeton, N. J. September 7–10.

Hawaii Territorial Medical Association. Honolulu, T. H. May.

Health and Accident Underwriters Conference. Chicago, Ill. May 24–26.

Hermann Michael Biggs Lecture—Annual. Subject, "Virus Diseases," Speaker, Thomas M. Rivers, M.D. New York Academy of Medicine, New York, N. Y. April 8 (8:30 P.M.).

International Association for Dental Research. Minneapolis, Minn. May 12–13.

Iowa Public Health Association. Des Moines, Ia. May.

Iowa Tuberculosis Association. Ottumwa, Ia. March.

Manufacturing Chemists Association of the United States. Sky Top, Pa. June 2–3.

Medical Library Association. Hotel Somerset, Boston, Mass. June 28–30.

Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13–15.

Michigan Public Health Association. Lansing, Mich. November 2–5.

Mississippi Valley Conference on Tuberculosis. St. Louis, Mo. October 1–3.

Missouri Public Health Association. Jefferson City, Mo. April.

National Biennial Nursing Convention. Hotel President, Kansas City, Mo. April 24–29.

National Conference of Social Workers—Joint Meeting with American Association of Schools of Social Work, and American Association of Schools of Social Work. Seattle, Wash. June 26–July 2.

National Conference on Weights and Measures. Washington, D. C. June.

National County Officers Association. Rock Island, Ill. May.

National Dairy Association. Columbus, Ohio. October 8–15.

National Education Association. New York, N. Y. June 26–30.

National Hospital Association (Negro). Hampton, Va. August 14–16.

National League of Nursing Education. Hotel President, Kansas City, Mo. April 24–29.

National Negro Health Week. March 27–April 2.

National Organization for Public Health Nursing. Hotel President, Kansas City, Mo. April 24–29.

National Probation Association. Seattle, Wash. June 24–28.

National Tuberculosis Association. Biltmore Hotel, Los Angeles, Calif. June 20–23.

New England Hospital Association. Boston, Mass. March 10–12.

New England Sewage Works Association. (Joint meeting with New York State Sewage Works Assn.) Hotel Bond, Hartford, Conn. October 6–8.

New Mexico Public Health Association. Albuquerque, N. M. June.

New York Heart Association—Scientific Session. New York Academy of Medicine, New York, N. Y. March 29.

New York State Sewage Works Association—Spring Meeting. Buffalo, N. Y. June 3–4.

Ohio Federation of Public Health Officials. Deshler Hotel, Columbus, Ohio. April 29.

Pennsylvania Public Health Association. Harrisburg, Pa. May.

Polish Medical and Dental Association of America. Pittsburgh, Pa. August.

Public Health Association of New York City. New York. March 9.

Smoke Prevention Association. Nashville, Tenn. May 24–27.

Social Work Publicity Council. Seattle, Wash. June 26–July 2.

South Carolina Public Health Association. Myrtle Beach, S. C. May 23–25.

Southern Medical Association. Oklahoma City, Okla. November.

State and Provincial Health Authorities of North America—Annual Meeting. Washington, D. C. April 9–12.

State and Territorial Health Officers Conference with the Surgeon General. Washington, D. C. April 9–12.

Texas Public Health Association. San Antonio, Tex. November 7–9.

Third International Congress for Microbiology. Waldorf-Astoria Hotel, New York, N. Y. September 2–9, 1939.

Western Branch, American Public Health Association. Hotel Multnomah, Portland, Ore. June 6–8.

FOREIGN

American Water Works Association—Canadian Section. Prince Edward Hotel, Windsor, Ont., Canada. March 23–25.

International Congress on Rheumatism and Hydrology—convened by the International Society of Medical Hydrology and the International League Against Rheumatism. Oxford, England. March 25–31.

Bath Congress on Chronic Rheumatism, to commemorate the bicentenary of the Bath Royal National Hospital for Rheumatic Diseases. Oxford, England. March 31–April 3.

Industrial Accident Prevention Associations, Inc. Windsor, Ont., Canada. April 28–29.

International Congress of Obstetrics and Gynecology. Amsterdam, The Netherlands. May 4–8.

International Association of Public Employment Services. Ottawa, Ont., Canada. May 26–28.

Ontario Health Officers' Association. Chateau Laurier, Ottawa, Ont., Canada. June 17–19.

Canadian Public Health Association. Lord Nelson Hotel, Halifax, N. S., Canada. June 20–22.

Royal Sanitary Institute. Portsmouth, England. July 11–16.

Scientific Congress of Doctors and Dentists—"ARPA." Prague, Czechoslovakia. July 21–25.

International Medical Society for Psychotherapy—10th Annual Congress. Balliol College, Oxford. England. July 29–August 2.